COMPUTERWORLD

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NEWS IN BRIEF

...ge Knocks Out ...'s DP Center

...OS ANGELES – A recent power failure here knocked out the city's computer center for about four hours, causing some delays in processing police wants and warrants.

The power outage occurred around 8 p.m. and an emergency backup system was up and running by midnight, enabling the center to catch up on all work by the time the day shift arrived in the morning.

The exact cause of the failure is still being investigated, even though the city initially blamed the outage on rainy weather. Officials later indicated the failure might have been caused by a problem in the system itself.

In a few weeks the city plans to have a battery-powered emergency system in operation so any power loss can be remedied more quickly.

DPMA Sets Feb. 15 Date For RBP Test Application

PARK RIDGE, Ill. – The deadline for filing applications for the 1973 Registered Business Programmer (RBP) examination is Feb. 15.

The examination, to be given April 28, 1973, in test centers in colleges and universities in the U.S. and Canada, consists of 180 questions and requires 4-1/2 hours to complete.

Currently, there are no formal qualifications for the examination. It is expected an applicant will have sufficient training and experience equal to that of a senior business programmer. Though the exam is sponsored by the Data Processing Management Association (DPMA), applicants do not have to be DPMA members.

An announcement and study guide, including an application for the examination, may be obtained from Certification & Testing Section, Education Department, DPMA International Headquarters, P.O. Box 195, Park Ridge, Ill. 60068.

On the Inside This Week

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Association Challenges N.Y. Access Arrangement Rates —*Page 13*

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Privacy Issue Grows More Lively

•Freeze Asked On LEAA Funds

By Michael D. Sorkin
Special to Computerworld

WASHINGTON, D.C. – Federal funding of criminal justice information systems should be halted until legislation providing privacy safeguards is adopted, a forthcoming report by a national civil rights group says.

The report, by the Lawyers' Committee for Civil Rights Under Law, said the Law Enforcement Assistance Administration (LEAA) of the U.S. Justice Department has spent at least $50 million to build computer systems out of the $1.5 billion LEAA has distributed to states in the last four years.

The files generated by these computer systems "contain too much information and are accessible to too many agencies, including private business concerns," the report charged.

"Few safeguards protect legitimate rights of personal privacy or prevent use in a discriminatory manner. The new information systems require immediate and comprehensive regulations and controls," it said.

The report called for a moratorium on LEAA spending on both state and federal computer systems until the completion of a study by a "neutral and reputable scien-

(Continued on Page 2)

•Canada Forms Data Bank Unit

By E. Drake Lundell Jr.
Of the CW Staff

OTTAWA, Ontario – The Canadian Government has established a special interdepartmental committee charged with drawing up privacy-protection rules for computerized data banks and is considering the introduction of an ombudsman to make sure the rules are adequate and enforced.

Trans-border flow of digital information may soon require the attention of the United Nations. This is one of the conclusions of the "Privacy and Computers Task Force Report" prepared for the Canadian Government. Story on Page 2.

The actions followed the recent release of the "Privacy and Computers Task Force Report" based on an 18-month study of privacy problems.

The swift action by the Canadian Government is in contrast to the reaction in the U.S., to the National Academy of Sciences report on privacy, which is still largely in the "being studied" phase.

Official Announcement

"The Federal Government has accepted in principle the conclusion of the task force that the first steps to protect the

(Continued on Page 2)

•SS Number As UID in Doubt

By Edward J. Bride
Of the CW Staff

BETHESDA, Md. – A government advisory committee may be leaning toward the conclusion that the Social Security number would not make a good Universal Identification (UID) number. The committee is also expected to make recommendations early next year on whether the very existence of a UID is in the public interest.

Now nearing the end of its year-long probe into the extent of computerizing files by SS number, the committee has heard testimony indicating the SS number is neither unique nor universal, making it undesirable as a UID.

Previous testimony indicated that migratory people were known to have as many as eight SS numbers. And in recent hearings a citizen appeared before the committee and reported he was one of three people with the same number.

Committee members were most disturbed by the fact that he was notified of this error through a form letter, indicating duplication might be more common than people believe.

Would Public Accept UID?

Other witnesses expressed doubt that a universal "enumeration" of individuals with an identifier could meet with public acceptance.

Many people today receive their Social Security numbers when they apply for federal benefits such as welfare, and this makes the assignment of the number a negative act, according to Ralph Abascal, a lawyer with the San Francisco Neighborhood Legal Assistance Foundation.

If enumeration – assignment of numbers to everyone – is inevitable, then Abascal favors assignment at birth,

(Continued on Page 2)

Full-Duplex 1,200 Bit/Sec

Modem Can Halve Line Cost

By Ronald A. Frank
Of the CW Staff

MOUNTAIN VIEW, Calif. – A modem that is said to reduce line costs by 50% and increase operating efficiency for data users will be introduced in February by Vadic Corp.

Capable of operating in full-duplex mode over a single 2-wire phone line, the synchronous modem provides four times the data rate of Bell's 103 data set while maintaining the same line discipline for connect, handshaking and disconnect functions, the company said.

Eliminate Turnaround Delay

The VA3400 modem can directly replace Bell 202 or equivalent modems "with no terminal or software modification in most instances, and eliminate turnaround delay," a Vadic spokesman said.

Several large data users who have seen the modem were impressed with its performance and cost-saving implications.

"The best you can do right now in an asymmetric transmission mode is 150 bit/sec or 300 bit/sec on the reverse channel with 1,200 bit/sec in the forward direction," one user said. But with this modem the user can operate at 1,200 bit/sec in both directions, he said.

"The trend seems to be toward using cassette storage as data repositories or data input devices. And these systems all run well at 1,200 bit/sec, so the terminal medium is ready and waiting for this type of transmission device," one user said.

Users already can input data at 1,200 bit/sec with 202-type data sets on a half-duplex basis, but this requires a wait for

(Continued on Page 4)

Novosti Press Agency Photo

Drivin' Ivan's Trains

Computer center at Koloma Electric Locomotive Plant in the Russian Federation is one of several complexes which help control the operation of the Soviet railroads. Story on Page 6.

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Problems With 'Trans-Border' Data Flow

Canadian Study Sees Role for UN in Privacy Issue

By E. Drake Lundell Jr.
Of the CW Staff

OTTAWA, Ontario – The United Nations might have to be called on to study the issue of computers and privacy since there is a great deal of data about citizens of one country presently being stored in computer-based data banks in other countries.

This is one of the most revealing conclusions of the recently issued "Privacy and Computers Task Force Report" prepared for the Canadian Departments of Communications and Justice. While the findings of the 18-month study have been openly hinted at for several months, the full report became available only last week.

"Critical policy issues are raised by these findings about the extent and content of trans-border flow of digital information," the report stated.

"A first step which may merit serious consideration would be a statutory requirement that Canadian companies and agencies making substantial use of data banks outside the country must register with an appropriate public body," it added.

However, the report said, "as the volume of the trans-border flow of digital information grows, the need for a coordination of legislative or other responses at the international level will increase.

"The UN might provide an appropriate forum for consideration of this problem," the report suggested.

The task force first noted "it is evident that the privacy debate encompasses political as well as purely legal issues, the former arising from concern, less about a possible loss of personal privacy, than from a fear that the possession by institutions of extensive and efficient information systems will enhance their ability to manipulate individuals and induce conformity.

"The solutions" to this problem "can only be found in a more even sharing of the power made available by computerized information systems," the report said.

The task force also recommended that governmental bodies that collect statistical information or other data bank types of dossiers develop stringent codes of ethics to govern their use but noted such activity was the "exception rather than the rule."

On the private side, the group noted that "self-regulation by data bank operators would appear to be of limited, though by no means negligible, value."

But it called for an overall government program to establish rules for governmental data banks and suggested that such regulations and rules could involve "the advantages of visibility (an ombudsman) with those of day-to-day effectiveness (administrative rules enforced by a central agency).

"Note has been taken of the benefit of establishing . . . some form of continuing surveillance agency which would be responsible for monitoring the conduct of data banks within the jurisdiction of the government, for studying technological trends, for considering proposed new systems . . . and for issuing reports containing, where appropriate, recommendations for the information of the public and for consideration by government."

'Where We Stand'

As for the present situation in the privacy-computer area, the report found:

- "More personal information is being collected than most Canadians probably suspect, and is being made available to a larger number of users than is probably supposed.
- "The enormous technological capabilities of computerized information systems can . . . raise certain threats to important human values – like privacy – which are integral to our very conception of what it is to be human.
- "The invention of computers gives rise in our time to a situation somewhat analogous to the discovery of iron in prehistoric times, for as the weapons fashioned from the new metal must have been a key element in the ancient power structures, so the computer's ability to store, manipulate and transmit data makes it a key component of power today.
- "There is probably more data interchange than is generally realized by the public. Information networks flourish in many situations where the exchange of personal data is beneficial to both parties involved.
- "There are few safeguards, for example, to counter the tendency of private corporations and particularly government institutions to gather more information than may be necessary for the purpose at hand; or to control the collection of information that might subsequently provide the basis for racial, religious or other unjust discrimination."

The Privacy and Computer Task Force Report is available for $2.50 from Communications Canada, Information Services, 100 Metcalfe St. here.

Canada Forms Data Bank Board

(Continued from Page 1)

information privacy of individuals should be applied to the government's own data banks and that specific privacy protective rules should be developed to regulate the data banks operated by the Federal Government," according to a statement issued by the Departments of Communications and Justice announcing the special committee.

The official statement also noted that an ombudsman-type office might well be part of the duties of the commissioner of rights and interests which is being established in the Department of Justice.

"The task force notes that the enormous power of computerized systems has until now been used almost exclusively to increase the amount of information about individuals held by public and private institutions, with little compensating increase in the amount of information about institutions available to the general public," the announcement said.

To remedy this, the official line promises "the Department of Communications will attempt to make certain that computers and all their associated technologies are used to increase, not reduce, the flow of information available to citizens."

In addition to specific programs to develop data banks and information systems of use to the general public, the statement noted "there is a need for some type of mechanism or institution to monitor continuously the broad social and cultural impact of computerized systems in areas such as privacy, the foreign content of Canadian information systems, employment and the provision of useful information to citizens and to recommend specific programs when needed."

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Report Asks Freeze on LEAA Funding

(Continued from Page 1)

tific body – such as the National Academy of Sciences or the National Commission on Individual Rights."

'Right to Privacy'

"Federal legislation should be passed creating an affirmative right to privacy, which would require the government to justify in advance any activity that would conflict with that right," the report urged.

The Lawyers' Committee – whose trustee membership includes former U.S. Attorneys General Ramsey Clark and Nicholas Katzenbach and former presidential aides Theodore Sorensen and Cyrus Vance – has just completed a one-year study of LEAA's anticrime revenue-sharing aid.

The report concluded the federal money has outfitted the nation's policemen with enough guns and surveillance gear to equip them for a "combat role." In effect, the funds are being used to turn police forces into a "domestic military apparatus," the report claimed.

Specific examples criticized in the report include:

- The funding of a computerized surveillance system modeled on one developed for use on the Ho Chi Minh Trail in Vietnam. It has been put into use by police along the Mexican-American border. The system – which relies on unmanned remote-controlled planes – is so sensitive, it is locking onto burros.
- Oklahoma's statewide police computer system, which the report said is collecting data on persons "who actively pursue their constitutional rights." The report said Oklahoma has information on 6,000 participants of antiwar marches, civil rights meetings and labor disputes.
- A proposal to attach electronic beeper devices (transponders) to all parolees, bailees, recidivists or dangerous persons. The radio signal emitted by the beeper would be picked up by a network of surveillance transceivers that would tie in to a computer.

"The system would enable the police to keep track of all accused or convicted persons," the report explained, and to intercept any potential activity. To prevent 'lack of cooperation' on the part of the offender, discarding any transponder would be a felony."

Vast Network

The report said that without proper safeguards the new criminal justice information network funded by LEAA can be used in conjunction with the vast government and private computer dossiers being compiled by credit bureaus, insurance companies, welfare agencies, mental health units and others.

"Cumulatively," it said, "these files threaten an 'information tyranny' that could lock each citizen into his past, and signal the end of a uniquely American promise – that the individual can shed past mistakes and entanglements, and start out anew."

The report also charged that transfer of the control of Project Search and other related state computer systems from LEAA to the FBI in 1970 had resulted in "diminished operational standards for the system's integrity, and attenuation of safeguards for individual privacy."

The Lawyers' Committee said the FBI is building a national data bank without congressional approval since the bureau is presently maintaining complete offender files for those states that have not yet built a centralized information file.

"The fact that the agency is presently maintaining complete files for all states makes it doubtful that they will subsequently abandon those files," the committee said.

Neither the states nor the Federal Government have developed adequate standards governing the collection of data, the report charged.

"The looseness of the access provisions becomes more ominous in view of the rapid growth of law enforcement-compiled intelligence files containing sensitive and unsubstantiated information," the report also claimed.

SS Number as UID in Doubt

(Continued from Page 1)

when no event other than birth could be connected with the number.

Computer experts have also testified the lack of a check digit in the SS number can lead to errors.

But its increasing usage in computer files, and the desire to identify all individuals, may nonetheless lead to some form of enumeration.

Also testifying at the hearings were representatives of People Against National Identity Cards (Panic), who fear the fight to protect privacy has been lost.

The Panic members were acting as if they felt no one cared about the privacy fight, remarked Dr. Robert Gallati, head of the New York State Identification and Intelligence System.

The Panic members were especially concerned over two-way cable television, with visual and auditory, as well as digital transmission.

The committee, officially designated the HEW Secretary's Advisory Committee on Automated Personal Data Systems, is expected to have a preliminary report on its findings early in January.

NSF Establishes New Section to Study DP Impact on Society, Grants Planned

WASHINGTON, D.C. – The National Science Foundation (NSF) has announced plans to support research into the impact of computers "on our way of life."

To understand this impact, the NSF has formed a new section, called Computer Impact on Society (CIS), within the Office of Computing Activities.

The CIS section will be subdivided into studies on organizations and individuals.

The main subject for the impact-on-organizations program will be the role of computers in management and decision-making at all levels, NSF said. The computer's influence on the future structure and behavior of social organizations will also be explored.

Projects to be considered for grants will include investigations of legal and economic problems, including security and privacy questions, and problems in areas such as automation, robotics and traffic flow.

The program will study work patterns and life styles; work will be supported on improving citizen access to automated information systems, including problems of ease of access, accuracy and confidentiality, NSF said.

Emphasis will be placed, NSF added, on improving the methods available for persons to communicate with machines.

Only a limited number of grants will be made during the remainder of fiscal year 1973, with concern primarily directed toward developing guidelines and priorities.

Chasing the Elusive Error

By a CW Staff Writer

NOTRE DAME, Ind. – "The more equations you use, the more accurately you describe the problem, but also the more error is introduced." This is the enigma facing Dr. Sidney Kelsey, professor of civil engineering at the University of Notre Dame.

Kelsey received a $59,300 grant from the National Science Foundation to find new ways to describe and evaluate the type of built-in errors that tend to grow with the use of extensive calculations, such as those used in figuring stresses on large buildings.

Errors enter the calculations in two ways, he explained. Original data is always approximate, and as the numbers are combined arithmetically any errors present are magnified.

Also, the computer, in rounding off decimals, introduces new "errors" with each calculation, he said.

"Therefore, any 'answer' given by the computer is only approximate to the physical reality," Kelsey noted.

In certain kinds of problems, the sets of equations seem to produce errors which are alike in some way, numbers which are either all too small or too large. Kelsey hopes to use this pattern of errors to produce a more useful, although less definite, statistical assessment of what the error is likely to be.

Rand Chief Raps Governmental Licensing, CDP

Special to Computerworld

LOS ANGELES – Until someone comes up with a firm definition of what a programmer is, it is not possible to design a really valid test that will help employers decide how to hire a good one.

Robert N. Reinstedt of the Rand Corp. expressed that opinion before a meeting of the Los Angeles Chapter of the ACM at which he voiced concern about government licensing and also voiced opposition to the Certificate in Data Processing testing.

Reinstedt said he opposed the CDP "because nobody really knows what a programmer is."

To head off any governmental attempt to license or regulate programmers, he said, "some pretty influential people in the field ought to get the ear of congressmen and fight it off as long as they can."

Reinstedt, associate departmental head of the Information Sciences and Mathematics Department at Rand, stressed the difficulty in establishing valid criteria for testing ability level.

Another problem in setting up selection tests, he said, is that now "we don't have the ability to view each individual as an individual but treat each as a member of a group based on statistics derived from groups."

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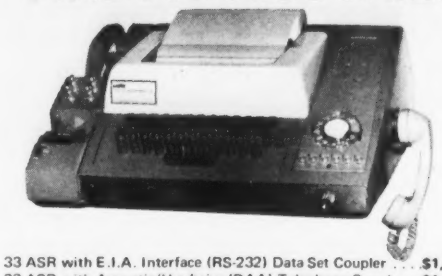

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Blames Mayor

'Absent' DPer Cites City Misuse

By E. Drake Lundell Jr.
Of the CW Staff

HONOLULU – After charging that the mayor here improperly misused the city's computers in a reelection bid, a computer specialist mysteriously disappeared and is still missing after a two-month police investigation.

Police confirmed last week that Larry E. Stevens, 33, formerly with the city Department of Information Systems and presently employed by the University of Hawaii, is still being sought.

In the meantime, Mayor Frank F. Fasi has been reelected.

The day before his disappearance on Oct. 5, Stevens charged in a notarized statement reported in the *Honolulu Advertiser* that the Fasi campaign organization had illegally used computer equipment and programming manpower valued at between "$50,000 and $100,000 of taxpayers' money."

The city Department of Information Systems is responsible for maintaining registered voter lists and is permitted to make the lists available for a fee to political parties and candidates.

The law concerning this, however, says the department cannot perform any special programming or devise any special operating procedures for parties or candidates for office.

But Stevens charged the department made special computer tapes for the Fasi organization, tapes which he charged gave it an advantage over the other candidates in the race.

Stevens said the department integrated the voter registration file with a file of addresses and telephone numbers obtained from Hawaiian Telephone Co., for use by the Fasi campaign.

Officials of the telephone company confirmed that the firm had lent the tapes of the phone numbers and addresses to the city, but denied any knowledge that the tapes were used for political purposes, the *Advertiser* reported.

The telephone numbers and addresses are important because the voter registration lists do not contain this information.

"The reason for combining the telephone numbers and voter-registration information was to be able to provide names and telephone numbers by precinct and district for volunteers (usually city employees) to use to conduct telephone polls from the mayor's campaign headquarters," Stevens stated in his affidavit.

"I know that various lists were in fact used for this purpose because I visited the mayor's headquarters and saw them in use," he added.

The city department was used to update information lists on voters from sources such as community organizations and social groups, he said.

"The manpower required to implement this very sophisticated system was provided by city employees during regular working hours as part of their regularly assigned duties," Stevens charged.

"I estimate that city employees have invested at least five man years of effort . . . during working hours on the development of this system.

"A conservative figure for this manpower would be $10,000 per year or $50,000. Since personnel costs are usually several times the cost of machine time, I estimate something on the order of $10,000 worth of computer time has been used.

"Therefore, I think it is fair to say that $50,000 to $100,000 of taxpayers' money has been diverted by the present administration from its proper course."

Gerald L. Mann Jr., director of the Department of Information Systems, denied the Stevens charges and denied the city had ever received a tape from the phone company, even though officials there confirmed that such a tape had been lent to the city.

Modem Could Cut Line Costs by 50%

(Continued from Page 1)

the line and modem to be turned around, one user said. The VA3400 will eliminate the turnaround by operating in a full-duplex environment.

"Right now we are running 4-wire service with CRTs," one user said. "This works fine with no turnaround required. But when we go to 2-wire with present modems, we need some type of line turnaround discipline which means extra software problems," he said.

"A full-duplex modem would allow us to perform the same operation on a 2-wire circuit and save one wire-pair or 50% of our present line costs," he said.

While some users were skeptical that the Vadic modem could operate on the bandwidth of a 2-wire circuit without degraded performance, most were eager to see the unit in operation. "They can use my installation as a test site any time they want," one user said.

Line Control Transferred

The modem, scheduled for first deliveries in the first quarter of 1973, performs 103-compatible handshaking at 202 data rates. When the device answers a call, it switches to 2,025 Hz for three seconds. It then transmits a steady mark signal until the handshaking sequence is complete. At the originating end, the dialer or operator hears the tone and transfers line control to the originate-mode modem.

As soon as the originate modem detects remote carrier, it begins to transmit its own carrier in a steady mark pattern. It also starts a 300-msec timer that clears all interface restrictions. The answering modem detects the carrier, starts its own 300-msec timer and clears interface signals. If the carrier breaks in either direction, the interface clamps are restored, Vadic said.

The $600 VA3400 provides terminal-controlled disconnect through the Data Terminal Ready signal. An abort timer disconnects a call if no carrier is detected within 12 seconds of answering a call. And a carrier-off disconnect circuit puts a data coupler on-hook if the carrier is lost for more than one second.

In addition to its full-duplex 1,200 bit/sec synchronous data rate, the modem operates at up to 150 bit/sec full-duplex asynchronous. It can be configured in both manual and automatic answer and originate modes. Diagnostic indicators and line condition displays are included in the unit. Vadic is at 505 E. Middlefield Road, 94040.

Model May Ease Ship Traffic Control

CAMBRIDGE, Mass. – A model of methods of harbor transportation control is expected to aid researchers in evaluating the cost effectiveness of proposed alternatives to the current "rules of the road" method, where there is little communication between ship operators or with the shore.

Under rules of the road, pilots depend largely on observing buoys in specified manners, and other time-honored practices such as passing an oncoming ship on her left.

Ship Accidents

Ship accidents currently result in about $800 million in losses to the shipping industry each year, with about a third of the damage caused by collisions. Most of these occur in harbors and rivers leading to harbors, according to Dr. John W. Devanney, operations researcher at MIT's Department of Ocean Engineering.

Other methods of communication being investigated are ship-to-ship radio communication and shore-based radar tracking and control.

Under a grant from the National Science Foundation, Devanney and his colleagues constructed a model to predict the movement of a ship approaching and moving through a harbor.

Devanney plans to stage "scenarios" where two or more ships interact, with various control schemes, from no ship operator communication, to operator-to-operator communications, to a land-based system, such as is used in airports. He will then try to determine how much effect the control method would have on the frequency of collisions.

Computer Scouts Scouts

TOKYO – A small computer helped the Japanese Boy Scouts celebrate their 50th anniversary recently.

Visitors to the Boy Scout Fair could take a perception and retention test on the computer, which also guided would-be Scouts to the nearest branch of the Boy Scouts of Nippon.

News Wrapup

Survey Reveals Unlicensed MDs

NEW YORK – In a recent survey of the Yellow Pages, the state attorney general's Bureau of Consumer Fraud and Protection found about 10% of those listed as physicians and psychologists in Manhattan, Brooklyn and Nassau County were not licensed.

Following the survey, the attorney general's office prodded the New York Telephone Co. to agree to start checking the professional qualifications and licenses of persons listed in the telephone books throughout the state as physicians and psychologists.

The bureau made its survey by comparing listings on random pages of the Yellow Pages with a computerized master list of licensed practitioners supplied by the state Education Department.

It found about 9% of listed physicians on three pages of the Manhattan Yellow Pages were unlicensed. In Brooklyn the figure was 13.8% from a check on one page and in Nassau County 7%.

The figures for unlicensed "psychologists" were 8.6% for Manhattan, 11% for Brooklyn and 3.7% for Nassau County.

Two professional organizations will assist the phone company in determining whether applicants for professional listings have the proper qualifications.

Bomb Blasts Argentine IBM Branch Office

SAN MIGUEL DE TUCUMAN, Argentina – A recent early morning bombing of a local IBM branch office here resulted in about $2,000 in damages, mostly to "iron curtains," windows, ceilings and partitions.

No equipment was damaged, according to IBM officials, and no injuries occurred in the 3 a.m. blast.

Officials said they did not know who set the bomb or why, although *Associated Press* reported it was apparently planted by Peronist guerrillas.

Executive Foresees Worldwide Data Banks

TORONTO, Ont. – "Problems arising from computerized information systems must be dealt with on a worldwide basis because of the global flow of information and the equipment used to process it," observed Robert P. Henderson, vice-president of Honeywell, Inc.

"In the not-too-distant future we will see the world's knowledge recorded electronically rather than on the printed page. We will see enormous archival computerized knowledge banks replacing books and libraries," Henderson predicted.

The social implications of this must be anticipated and steps taken to prevent such systems from having adverse effects, he stressed.

In addition to the issue of privacy protection, Henderson noted, data banks could give rise to other problems such as system integrity and data accuracy, and he urged business and government to join with computer firms to aid in the design of safeguards.

System to Help Eliminate 'Expired' Drivers

LANSING, Mich. – A recent check of license records here revealed that "at any given time 40% of the licensed drivers in Michigan are driving on expired licenses," a state spokesman said.

But a new computerized licensing program should help eliminate that problem as well as provide some extra benefits.

Each day the computer will print out license application renewals for all drivers whose licenses are due to expire in three months. Drivers will have the full 90-day period to come to a branch office or police station to fill out the necessary forms.

The computer system will automatically not send renewal applications to persons with suspended or revoked licenses. "Problem" drivers will have a special code on their applications so local offices can determine whether a reexamination is necessary before renewal.

FBI Criminal History File Flourishing

WASHINGTON, D.C. – The FBI's data bank of wanted persons and stolen goods passed another milestone recently, when the four millionth record was entered into the computer system.

The largest category of stolen items is securities, which accounts for 1.3 million records; there are over 120,000 wanted persons and some 800,000 stolen vehicles in the data base.

Thesaurus Contains 6,000 Computing Terms

MANCHESTER, England – The National Computing Centre has made its "Thesaurus of Computing Terms" generally available. The book contains over 6,000 describers of terminology associated with computing and computers.

The thesaurus is revised about three times a year and provisions are made for feedback from users to the publishers to include new terms.

The thesaurus is available from bookshops and library suppliers or direct from the publisher – David and Charles, South Devon House, Newton Abbot, Devon, England.

Spelling Bees May Never Be the Same!

RED DEER, Alta. – Is it "i" before "e" or "e" before "i"? If you are one of those people who has trouble remembering spelling rules, an experimental program in computer-assisted instruction at Red Deer College here may offer some help.

The words to be spelled are prerecorded on a cassette tape which the student operates himself at a typewriter terminal, while the instructor is available by telephone should any technical difficulty arise. If the student types the correct spelling, he is directed to proceed to the next word in the series. If his spelling is incorrect, the student is given a hint as to where he is in error and is asked to try again. A student thereby progresses at his own rate.

The program uses an IBM 2741 typewriter terminal on-line to a 360/67 at the University of Alberta in Edmonton.

Centers Likened to External Suppliers, Managers Urged to Charge for Services

By Edward J. Bride
Of the CW Staff

ANAHEIM, Calif. – Computer centers serve their companies just as outside suppliers do, and they should enforce charge-back systems just as the outside vendors insist on getting paid for their products.

Consultant John J. Pendray, who likened DP departments to external suppliers, cautioned DP managers to charge for their services, assuring that the charges are less than or equal to the value of the service.

Optimization

Part of a computer operation must be optimizing people and equipment, he noted. The computer department is responsible for resource optimization, to allocate the "cost" portion of the cost/value equation, he noted.

The goal of optimizing people is not technical expertise, and "not how many papers at Fall Joint carry the company's name," he continued; the goal is simply productivity.

A chief way of optimizing people, he suggested, is a three-pronged people-management program consisting of training, a continuing challenge to the talents of personnel and the proper orientation of personnel to the company's views.

"Brainwashing is another word for orientation," he noted.

Two key points of his presentation, Pendray suggested, were the proper equation between cost and value of DP services, and the response of resources to job requirements, rather than to people.

Explaining the second item, Pendray said a computer center's product is DP services, and these should apply to the need of the user department, rather than to the ego of the department head.

Three-Hour Session

The "Problems and Practices" session at the Fall Joint Computer Conference lasted for three hours, and was part of the user and applications division of the conference.

Ross Penne of the University of Southern California was coordinator for all eight sessions in this division, and was also chairman of the "problems and practices" session.

Other speakers discussed specific algorithms for charging for DP usage, and one discussed facilities management as an alternative to the in-house DP center.

Requirements Outlined

Charles B. Kreitzberg of the Educational Testing Service outlined the requirements of a job-pricing system, whether for actual cash exchange or simply for accountability purposes within an organization.

First, he said, the charges must be "reproducible," or consistent. This requirement can be difficult in a multiprogramming environment, when the number of users tied into a system can cause a variation in the run time for a job, he noted.

Job billing must be equitable, he said, making sure actual work is the subject of the bill, and not just connect time or run time.

After these objectives, Kreitzberg listed the following requirements for a computer-service bill:

- Sufficient to recover costs ("Even if you don't actually charge for the service, you must know what it costs you to run a job.").
- Auditable.
- Compatible with efficient hardware use (Users will write programs that are beneficial to them, and not to the DP center, he added.).

In a "single-thread environment" (not with multiprogramming), the user would pay for the entire configuration and still meet the suggested criteria, Kreitzberg noted, conceding this was expensive.

With multiprogramming, however, a user should pay only for the equipment actually being used on his applications; it is "not ethical" to charge for a whole system if it is not being used, he said.

Fred T. Grampp of Bell Telephone Laboratories continued the theme of accounting for computer usage, noting reports to users must be complete, yet concise.

Users are interested in comparing the bill against projected costs, and are probably not interested in hour-by-hour charges, Grampp said. Even so, if questions arise, the computer center should be prepared to provide detailed listings of charges.

Four ideas Grampp suggested as most important were headed by flexibility of the computer system.

Flexibility is required because the addition of new equipment, peripherals, core, etc., can cause changes in the accounting algorithm, Grampp noted.

He also said a division of programming efforts could reduce the cost of a system; data should be safe from inadvertent destruction (separate from the physical-security concern of less-technically oriented people); and a system should be simple to operate.

CW Photo by Edward J. Bride

J.J. Pendray, F.T. Grampp and C.B. Kreitzberg ponder audience question at the problems and practices session.

For Technology

Lawyers Said to Need Special Knowledge

By Edward J. Bride
Of the CW Staff

SAN FRANCISCO – Lawyers need specialized knowledge if they are to serve computer users well, and the knowledge must be applied to computer technology, as well as to contract and tax laws.

This was the consensus of some 130 barristers and users gathered for a special course entitled "Law and Computers in the Seventies." The three-day session was a joint project of the American Law Institute and the American Bar Association.

Almost all the attendees were involved in contracting for computers or in some other legal aspect of computers, with users in a small minority, according to Roy N. Freed, planning chairman for the event.

One of the first pieces of advice to attendees concerned the point-in-time at which a lawyer should be involved in contract disputes. William A. Fenwick suggested the point is reached when a party is convinced the problem is not one of communications; he also said lawyers should be consulted before a hard, fast position has been formulated.

Retain Documentation

Fenwick also said users or suppliers should follow one basic programming principle: retain all documentation, regardless of the media, that relates in any way to the subject matter of the potential dispute.

When simple lateness of delivery is involved, problems are much less complicated than with hardware or software failures, Fenwick noted.

In these cases, lawyers must be familiar with or at least have a workable understanding of DP concepts, he suggested.

Fenwick said caution must be used in filing lawsuits, since litigation filed by either side will probably obviate any future relationships, at least regarding any close cooperative efforts.

Broad Spectrum

The spectrum covered in the 13 sessions was broad, ranging from contracting procedures to software marketing considerations to advice on litigation.

Freed, who conducted three of the 13 sessions, said the course would be given again next September in New York, because lawyers are finally beginning to realize the need for interdisciplinary effort where computer deals are involved.

European Users 'Different'

LONDON – As Europeans have long stressed, there is a difference in the English, the French and the Germans, but it would seem logical that computers of similar design and software capabilities would be used for similar applications despite geography.

But a study of how European users use their systems indicated that different nations use the same types of equipment for completely different applications.

For example, the study by IDC Europa Ltd. showed the English have a definite preference for overworking small computers – those leasing for under $2,500 – in the area of banking, finance and insurance. The small computer used here is worked an average of 95 hr/wk compared to an average small computer usage of 52 hr/wk in the rest of Europe.

Germans work their small machines in education, medicine and other services twice as hard as they work similar machines in other areas – 96 hr/wk, compared to 48 hr/wk.

In general, the German user makes less use of his small computer than any other European user. A possible explanation cited by the study is the high degree of standardization of German accounting systems which use dedicated small computers. Germans tend to leave other applications to larger machines.

The rest of the European users tend to use not only their small but all their computers for "bread and butter" applications such as manufacturing and trade.

The English have a slight tendency to work medium-size machines – those rented for $2,500 to $12,000/mo – harder in service applications and durable manufacturing (soft goods including electronics).

The German medium-size computer user is not at all interested in service work and shows only a slight preference for banking and finance, the study noted.

The Frenchman drives his middle-size machine hardest in the areas of transportation, communication and public utilities applications.

And he makes the most use of machines in government applications with middle-size computers averaging a 99-hr work week.

All Applications

For large computers – renting for more than $12,000/mo – English use is spread fairly evenly across all applications with a slight increase in transport and trade and the absence of any computer usage in agriculture, mining and construction.

The Germans are more obvious in their abstention from using large machines in the areas of agriculture, soft goods manufacturing, trade, service bureaus and government, the study said.

The French use of large machines tends to show a more socialized society with machines used in the service areas, communications and transportation and government, according to the study.

Computer Guides Student Careers

TORONTO, Ont. – Twenty-one schools are using a computerized guidance service offered by the Ministry of Education in a pilot program here.

Currently students submit questions about career opportunities and advanced studies to the ministry, and receive printouts containing information pertinent to their indicated fields of interest.

The project is designed to relieve high-school counselors of doing research to answer questions, as well as to stimulate the students' interest in career planning.

If the project receives government approval, the service will be available next fall to all Ontario schools willing to pay the fee, which is estimated at $1,100 a year for an average size school.

Eventual plans call for schools to install terminals, so the students can query the computer when they want. The estimated cost for the service and terminals per school is $3,000 or more a year.

The Day They All Came to Pay Their Fines

MADISON, Wis. – Dane County parking court was standing room only recently when about 250 summons recipients materialized.

The same number of computer-generated summonses was sent out for this day as for any other, about 200. But normally about 50 to 70 persons appear, according to Court Officer Don Uselmann.

The rest pay their fines or have moved out of town, he said.

But the group receiving the summonses included persons who had requested specific court dates, since as early as last May.

Uselmann said he figured this would be about another 20 persons, and had an extra man on duty in the court that day to handle the extra number. But no one anticipated the end result, he said.

About 75 persons paid their fines and left, rather than wait to be heard. The judge then dismissed three quarters of the cases that came before him, he added.

The names of summons recipients were compiled by computer, proceeding alphabetically by license plate, Uselmann explained.

Since the foul up, he has been told that persons requesting a hearing will be added to the list for the next court date, rather than wait for their turn in the alphabet cycle.

One possible reason for the delay in giving these persons a date, he added, was that a delay in matching the license plate numbers of parking offenders with Department of Motor Vehicle tapes of registration material would cause delay in notification.

13 Computer Centers

Soviet Railroads Rolling Right Along

Novosti Press Agency

Computers are playing an increasingly important role in the operation of the railroad lines that connect the vast areas of the Soviet Union.

At present there are 13 computer centers in operation on the Moscow, Gorki, October, Sverdlovsk, South-Urals, Donetsk, Kuibyshev, South-Western, Byelorussian, Baltic, Lvov, East-Siberian and Southern railroad lines. Laboratories of computer technology have been set up on 12 of these lines.

Special communications channels connecting computer centers with major stations and depots are being planned for the Moscow, Gorki and October lines. Designs for the main computer center of the Ministry of Railroads are nearing completion.

At present, Soviet railroads use 40 computers of the Ural and Minsk series and by the end of this year, 10 more computers will be put into operation.

Computer centers and railroad laboratories employ 2,040 persons: 626 specialists are engaged in the development of algorithms and programs; 596 persons are responsible for computer operations and 459 experts are engaged in data processing.

Training Courses

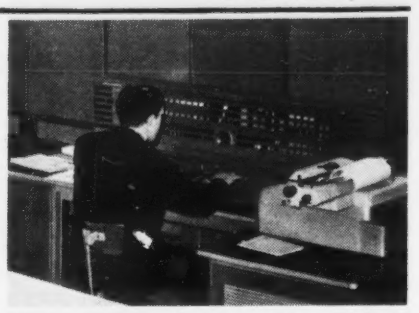
Transport institutes have departments for training specialists in computer technology, automatic control systems and applied mathematics. Advanced training courses on computer technology and automatic control systems for managerial personnel, engineers and technicians have also been organized.

Computers are used at 26 railroad yards to make day-to-day plans. These plans cover train arrival, distribution of trains according to their destinations, train formation etc. Data on trains, the time of their approach to the station, the availability of cars in the sorting yards and the availability of trains at the points of departure and destination are fed into the computers via telegraph communication channels. Plans are calculated by computers and sent to traffic control departments. The computerized plans have reduced the cost of car handling and resulted in an average idle time reduction equal to 30 min/day.

The Laboratory of Computer Technology of the USSR Ministry of Railroads is currently developing a seven day traffic forecast for the railroad network. Knowledge of the exact traffic load on all lines will ensure more rational control of the available storage tracks and, consequently, reduce the run of empties.

On some railroad lines computers are used to plan work shifts and operations for a 24-hour period. On the basis of statistical data and existing operational conditions the computer prints out plans for delivery of local freight, unloading, etc. and determines the volume of train and car transfer via interline junctions.

At present, 20 rail lines are calculating monthly plans of operation on the basis of orders placed by freight shippers. In addition, the computers check to make sure static load regulations are being observed and that the plans are compatible with authorized schedules for normal traffic flow.



Ural-4 computer is used at Moscow Railway computer center.

Car Pool Decongests UCLA Parking Lots

LOS ANGELES, Calif. – A UCLA service fraternity and a group of computer buffs have developed computerized car pools to ease the campus parking problem, save gas and lower the Los Angeles pollution count.

A student registering for a parking permit fills out a car pool application and lists his address and class schedule. The information is fed into a computer and in a few days the student receives a computer printout with his own name, address, phone number, sex, campus arrival and departure time, and whether he owns a car.

This is followed by the names of seven other students living in the applicant's immediate neighborhood and whose class schedules match his as closely as possible. The applicant then phones as many of the seven as he wants, until he works out a share-the-ride arrangement.

The system was conceived last year by Robert Kibrick, then a UCLA engineering student and member of the campus computer club, and got its first workout with the beginning of the 1972-73 fall quarter.

A service fraternity had been running a non-automated car pool system on campus for a number of years with a set of file cards and a large wall map of the Los Angeles area.

Taking the fraternity's car pool registrants as a base, Kibrick and two fellow students surveyed their needs and preferences as a class project in a special course on population-environment problems.

In the final version, a 2,400 square mile area, encompassing Los Angeles and parts of Orange and Ventura counties, was divided into 6000 sectors. Each sector measured three-quarters of a mile on each side, allowing each car pool applicant and his potential riders to be precisely located.

In addition, the computer program was able to detect invalid zip or phone area codes and irrational time schedules.

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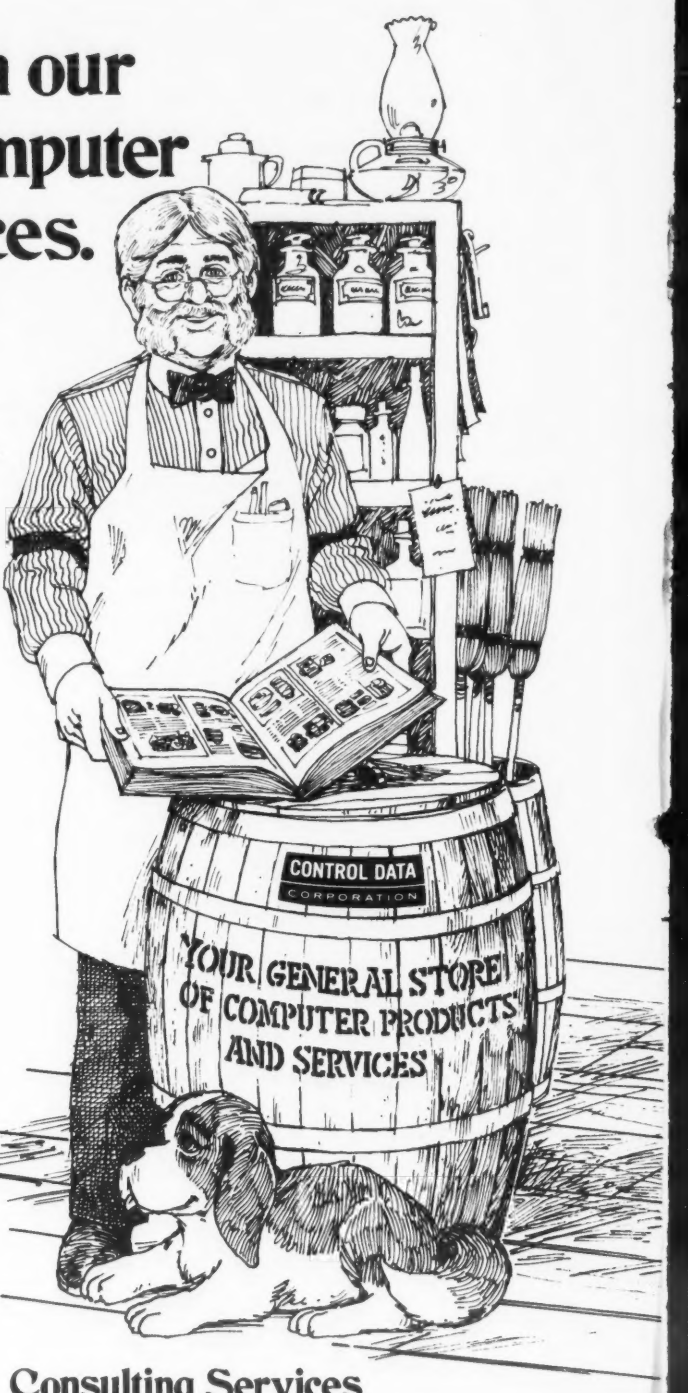

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DP Project Gives Black Education Big Step Forward

Special to Computerworld

NORTHRIDGE, Calif. – The Ujima Educational Computer Center, a project of the Educational Opportunities Program (EOP), is a step in a new direction for Black education.

The EOP of California State University, Northridge, in existence for four years, was initially designed to serve those minority students who lacked the financial resources or the usual academic background, or both, necessary to enter a college or university. It was also designed to provide these students with the necessary tutorial assistance to enable them to compete at college-level education.

After intensive writing, analysis and rewriting proposals, the Ujima Educational Computer Center evolved as the project best suited to serve a three-fold purpose:

- Encourage Black students to go into scientific fields of concentration.
- Provide students with tutorial assistance and promote a high level of efficiency to eliminate problems of academic inadequacy.
- Eliminate fears of minority students, who find themselves in a predominantly white culture, with psychological and racial problems.

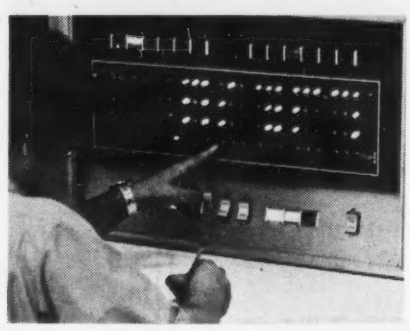
The project essentially gives the student those needed prerequisites and motivates him to continue to pursue his interest in math and science at the college level.

This project is designed to improve math skills through computer programming and operation and is structured around an open shop computer center where students can run their own programs on a Honeywell 225.

The Ujima Project is in its first semester of operation with Keith Bass as co-director and Billy Johnson, assistant.

Students from George Washington High School were required to have had a prerequisite of algebra and grade levels 10-12. They receive five high school credits for the satisfactory completion of the class.

The class content consists of the history of data processing, computer math, basic logic, on-the-site information processing



Students improve math skills through programming and operation.

system, Hollerith code, keypunch machine, computer terminology, operation and programming and diverse programming languages. In addition to the class, all participants in the project are given college preparatory counseling throughout high school.

Contributions

The sponsor for the Ujima Project is the Associated Students of California State University, Northridge, which provides money for administrative and operating expenses. Through Stan Denadel, director of computer operations for the Bank of America, the project was able to obtain two instructors and supplementary materials from the Bank of America Data Processing Center.

The computer was donated by California State University, Northridge. Honeywell refurbished the system and is giving complete maintenance services for the entire computer system, and training for personnel. Also, International Business Machines contributed two keypunch machines.

Homosexual Vote Only 'Tip of Iceberg'

SAN FRANCISCO – The gay or homosexual vote is becoming a factor in political elections here and possibly in other areas of the country, according to a computerized analysis of the June 6 primary here.

The study, performed by Scientific Analysis Corp. here, found the gay community, "like the San Francisco population in general, votes heavily Democratic with a significant conservative minority that will swing Democratic under certain circumstances."

To perform the study the citywide vote patterns for seven candidates were blended into a single factor pattern through the SPSS subprogram Factor, using an IBM 360/50, the firm said.

The reason that the firm was interested in pinpointing gay voters was that an announced homosexual, Earl Rick Stokes, was running for the Community College Board.

Through the analysis, the firm found the gay vote is "geographically concentrated in certain key areas" including the 18th Assembly district, with some influence in 20th and 23rd districts. The vote had only a negligible – "if not negative" – effect in one other district.

"We believe this study is a valuable documentation of an emerging political phenomenon," the firm said.

"The importance of the gay vote in urban politics should not be underestimated. Only the tip of the iceberg has so far emerged. We are sure that a strong trend is developing – politicians everywhere would do well to watch it."

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Editorial

How to Succeed

The most successful Joint Computer Conference in recent years is now history.

This year's show was successful from the three most important viewpoints: attendance, exhibits and technical programs.

The attendance of over 21,000 was more than the sponsoring American Federation of Information Processing Societies had expected; the exhibits were sold out and received high marks for educational content from attendees; and most of the technical sessions also proved to have great value to many users.

Buoyed by these results, Afips now should realize that increased user participation and technical sessions aimed at user needs can mean a successful show.

The National Computer Conference should continue this pattern and improve upon it.

'There Oughta Be a Law'

Letters to the Editor

EDP Auditor Needs Management Support

Alan Taylor's report on "Bring Off-Line Manager On-Line – Let's Give the Internal Auditor Full Responsibility" in the Nov. 22 issue highlights the need for a new direction toward EDP management.

The crucial point still remains whether an EDP auditor is an evil or a good omen to EDP operations.

Generally, I would qualify that he is an evil omen in the eyes of incompetent EDP management, and a good omen to competent EDP management. An experienced EDP auditor can, and does, have unlimited potential to make significant contributions not only in the area of internal controls, but also in the efficiency of the EDP operation, which includes system design and hardware configuration.

Unfortunately, the EDP management has consistently used the argument to top management that the area of EDP operation is too technical and is beyond the professional ability of an EDP auditor, in order to disguise the inherent inefficiencies.

It is my belief that EDP management will continue to restrict the EDP auditor in order to keep sensitive areas under its control, unless top management takes keen interest and supports the EDP auditor in performing his function, without any restrictions.

Gabriel G. Tashji
Management Analyst, EDP
Internal Auditing Department
Continental Can Co., Inc.
New York, N.Y.

Internal Auditing Position Ambiguous

An internal auditor is not an internal auditor... The ideas presented in this particular column of the Taylor Report sound interesting, but they represent an oversimplification of the current state of the art.

The internal auditing position within the firm is ambiguous. Certainly, there are highly trained internal auditors who perform an operational auditing function similar to that of the Government Accounting Office.

These individuals are *sometimes* well trained in electronic data processing and can perform the functions suggested by Taylor.

On the other hand, many firms utilize the internal auditing position as an entry-level training position. In this context, they recruit recent college graduates as internal auditors and use the internal auditing position as a means for giving them sufficient mobility around the firm to obtain an overview regarding the firm's activities.

To the extent that this latter approach is being followed, the proposal by Taylor is somewhat unrealistic. These individuals are not adequately trained in the data processing area nor do they have sufficient insight into the firm and its activities to serve the functions being proposed.

The concept of Taylor's proposal is quite sound. Its implementation still leaves a number of points to be resolved.

Myron Uretsky
Associate Professor of Accounting
New York University
Graduate School of
Business Administration
New York, N.Y.

IBM Criticized For Lack of Memory

In the Dec. 6 issue in the "Letters to the Editor" section there appeared a letter from J.B. Macfarlane, Manager, Industrial Products Marketing, IBM Corp., commenting on add-on memory systems supplied for the IBM 370/155 and 370/165.

Macfarlane himself appears to have a selective memory. On Thursday, Oct. 26, 1972, members of Macfarlane's staff and Macfarlane met with the management of Cambridge Memories, Inc. and provided CMI with a letter dated Oct. 24, 1972, which stated "that the unaltered portion of our CPU is practical for IBM customer engineers to maintain under our standard maintenance agreements."

This letter referenced our first installation of CMI's 370/Stor on an IBM 370/155 system.

CMI is surprised at IBM's lack of memory, especially when we are shipping more than 1M bytes of 155 add-on memory per week. From the standpoint of representing the users' interests, we hope this was an oversight.

Robert L. Hengen
Vice-President
Cambridge Memories, Inc.
Newton, Mass.

Firm Remembers Letter From IBM

IBM stated in a letter written by J. B. Macfarlane [CW, Dec. 6] that in the case of the 370/155 it had found maintenance practical for the unaltered portion of the CPU for three specific independent suppliers.

Memory Technology's name was omitted.

On Oct. 17, J.R. McDonald of IBM sent a formal letter to Memory Technology stating that continued maintenance of the 370/155 with Memory Technology's 755 memory attached was practical. Since then, another configuration has received similar certification from IBM.

Paul L. Rosenbaum
Vice-President, Marketing
Memory Technology, Inc.
Sudbury, Mass.

Getting Better People

I speak for a group of professional data processing people in the Chicago area. We must speak out regarding the CDP and the ACM "Computer Foundation."

The ACM, generally respected, should check the reputation of DPMA. Some DPMA chapters have officers of only people who sell to the industry or people who might buy.

Both DPMA, ACM and we ourselves want to solve the problems of how to develop and evaluate talent in our field.

Why not an educational program first, then a testing program? This whole idea needs to have a better overview.

Why not extend help to colleges and trade schools which already are trying so hard to develop good programs? Why not try to get companies and schools together for work study programs and night programs for present company members.

The fact is known, we need better people. How to get and develop them is the question.

Robert E. Sennet
Instructor and Consultant
Streamwood, Ill.

'Billing Date' Needed?

Re: the Taylor Report, Dec. 6.

Alan Taylor's latest case history of "unprofessionalism" does not seem to rest on the same solid reasoning which I have come to expect in his column.

There is no argument that a bill must be mailed sufficiently before the due date of a payment so the customer will have a reasonable opportunity to respond. I don't believe there is any need at all, except for internal control, to print a "billing date" – regardless of the meaning of the term.

By M.L. Tolhurst's definition, even if the billing date and mailing date coincided, his "bill-paying system" would not necessarily permit him to meet the expectations of the billing company. Under these conditions, his severance of the vendor's account seems to be reasonable if he can replace the service with one he prefers.

The implication that all vendors should adopt billing practices that meet the bill-paying habits of their clients may be too costly to warrant serious consideration.

Otto Almasy
Director of Services & Systems
Transamerica Insurance Group
Los Angeles, Calif.

Credit Bill Revived

Regarding M.L. Tolhurst's Bankamericard billing problem [CW, Dec. 6], readers may be interested in S. 652, the "Fair Credit Billing Act," introduced in the Senate this last session by Sen. William Proxmire (D-Wis.) and Sen. Edward Brooke (R-Mass.).

One provision prohibits imposing a finance charge of the type described unless the statement was mailed at least 21 days prior to the last date of the "free credit" period. Some other provisions in the "Fair Credit Act" would require:

- A card issuer who has issued a credit card to a cardholder shall be subject to all claims and defenses arising out of any transaction in which the credit card is used as a method of payment or extension of credit.
- Amend 127 (b) (2) of the Truth in Lending Act by adding a requirement that the card issuer identify on the periodic statement the "vendors and/or creditors involved."
- Amend 127 (b) to require that the periodic statements contain an address or telephone number for use by the cardholder in making inquiries about his billing statement.
- Require the card issuer to acknowledge complaints about billing statement errors within 10 days and correct the account within 30 days, or send the cardholder an explanation with documentary evidence of the accuracy of the account.
- Require the creditor, in determining the balance upon which the finance charge is computed, to reduce the opening balance in the account at the beginning of the billing cycle by deducting all payments and credits made during the cycle.
- Prohibit open-end creditors from imposing minimum finance charges.
- Prohibit credit card issuers from offsetting a cardholder's indebtedness against funds of the cardholder held on deposit with the card issuer.
- Assure the consumer of his right to refund of any credit balance in his account.

So far as I know, the bill did not pass because of heavy opposition from banks, retailers and others operating credit-card plans, but will probably be reintroduced next session. Readers may wish to express their views on this bill to their legislators.

Robert L. Randall
New York, N.Y.

Do the Churches Hold the Key To Our Professional Salvation?

The Taylor Report
By
Alan Taylor, CDP

Like many other people at this time of year I receive some surprise packages and I certainly welcome them. This year, however, any surprise I get will have to be really surprising if they are to equal in shock value two of the latest received.

Taken together (and perhaps with a little bit of seasonal goodwill), these indicate there may be a new player on the data processing standards board next year, a player whose participation we have previously despaired of obtaining.

This new player – who can genuinely represent the public interest – will hopefully be able to balance the current representations of our technical interests in areas such as standards – and so improve the usefulness of data processing.

Public interest, of course, has always received token representation. Robert Brown, the director of standards at the Business Equipment Manufacturers Association, pointed out the difficulty of real representation to me last month. "For instance," he said, "take the credit card committee. There is no organization of holders of American Express Credit Card holders, so these are being represented by American Express."

Well – that's one way of doing it, but, I feel, not a very satisfactory one. Perhaps it is the best available plan under the circumstances – but one where an alternative is certainly needed.

And a possible alternative appeared in my surprise packages. The alternative was none other than the churches whose processions and services are such a unifying feature of this holiday season.

Not because they are churches. Temples and agnostic associations also may carry our professional salvation because they, like the churches, are interested in people's welfare generally, and have among their members many technically literate people who may guide their representation.

The surprise packages that showed this were, on the one hand, the front page of the November *Universalist World*, and part of a report from Ken Lord, vice-president, administration, Society of Certified Data processors, on the first cash sales of the copies of the new proposed SCDP standards on data bases and data storage systems

The front page article deals with a letter from Dr. Robert West, president of the Unitarian Universalist Association, about the Social Security Number and privacy problems.

Based upon a resolution of the Annual Assembly, West is asking for a reversal of the current priorities, where the needs of the computer are often considered paramount. Instead, he urges that the computer only be permitted to operate where it is known that people are not in danger of losing their rights. A very reasonable idea, in my opinion.

The report from Lord showed that the first two organizations to take sufficient interest in possible standards for data base, data use, and data storage systems were – you guessed it – two other denominations.

And that really surprised me. It also set me thinking about the possibilities of obtaining a real informed representation of the public on the committees of the American National Standards Institute, and in professional affairs in general.

The biggest surprise of all came at that point – for I found it quite within the realm of possibility. Here are some of the points which are evident in this situation:

• Travel Expenses – Avoided!

One of the biggest costs involved in user standards activities is the high travel costs.

The Conference on Data Systems Languages – a conference which is not officially an Ansi standard committee but which W.F. McClelland, IBM's director of standards relations, says "has the responsibility of developing the Cobol language for the American National Standards Institute" – is perhaps an extreme case, because its members even travel outside the country for some meetings. Even so, by selecting alternates, local ministers or members of local congregations would often be able to attend without travel costs!

If the local minister could be given proper instructions, he could be quite effective in bringing motions to the floor, seeing that the rejected suggestions were not just put into the wastepaper basket. Since their duties would be simply to watch that the public interest was not ignored, they would not need too much training in their role.

• Effectiveness Multiplied!

When anyone in standards discusses the reasons why he voted against some proposal or another, it is not long before he mentions the need to "get along" with the rest of the committee to ensure that his particular wishes will be considered later. Public representatives from church groups which simply want the interests of the public preserved would not be open to such indirect pressures, and would be able to press their points effectively.

(If they really wanted, they could even press their points in sermons stressing just how they felt the public interest was being protected. It just could be that the local population might be quite interested and quite surprised.)

• Wide Expertise Available

The problem of narrow expertise has also been a problem in standards affairs. To provide for an effective representative on committees a firm must usually find for the selected employee a position with no day-by-day duties (so he can attend those week-long meetings in Miami or Los Angeles or Dayton).

Soon it becomes obvious that it is even more efficient for him to be an expert "committee-man" serving on perhaps two or three committees. The result is that he takes on committee work as his profession, and leaves the real operational experts almost unrepresented.

By contrast, the practice of drawing upon the experts in the congregations of the churches, through some form of "expert committees" that could be set up, would allow a wider selection of really independent and really operational experts than is currently being effectively used.

Present for DP

So, it does appear that here is a real possibility for action. I think it would be a marvelous Christmas present for the data processing profession if it could have some of these public interest representatives appear on its committees. I am sure there is an interest – the independent actions of the three denominations prove this.

I am sure that the capabilities exist in the various congregations – and all that is really needed now is a structure to bring the whole together.

That, of course, means people – and may mean you the reader. If you are interested and prepared to help your denomination with a few hours of work once a month from home – fill in the coupon on this page. Give me the name of the denomination, an idea of what you are interested in, whether you could help start such a denominational technical advisory committee or only want to work for it – and other comments.

That will be a true Christmas present, for which many people will eventually thank you.

A Merry Christmas to everyone – and a Happy New Year to all my friends.

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Volunteers for Church Technical Committees

Any reader interested in serving on his own denominational data processing technical advisory committee, if one were started or currently exists, should fill in the form. His name and details will then be sent to the denominational authority concerned, in the hope that something effective will emerge in the new year, and that public interest will be more effectively represented in data processing standards.

Name _____ Title _____

Address _____

_____

Denomination _____

Comments or suggestions _____

_____

When completed please send to Alan Taylor CDP, c/o Taylor Reports, c/o Computerworld, 797 Washington Street, Newton, Mass. 02160.

Letters to the Editor

DP Managers Must First Act as Professionals

I read with interest and concern the article entitled "Users Reticent to Move Away From IBM" in the Nov. 29 issue.

Over the years we in data processing have been striving for recognition as professionals. This article points out the major reasons why we will not achieve our recognition goal:

- Managers let IBM lead them around by the nose. These managers do not know enough about their "profession" to realize when they are being misguided, or what to do about it.
- Managers opt for the safety of choosing IBM even when they know other equipment could save money. These managers feel, and act, as though IBM were signing their paychecks.
- Managers fear if they go to other vendors and there are failures IBM will use its leverage to imply it is the data processing manager's fault. With a contractual agreement even IBM knows that failure to provide service per the contract will bring repercussions from a DP manager who will stand up and demand the contract be fulfilled.
- Most of us recognize IBM's favorite tactic of going over the DP manager's head when said manager stirs up the mud. If the DP manager keeps his management informed and advised of this tactic, the effect will be minimized.
- Some firms have come to trust their IBM salesman more than their DP manager. This may be due to the lack of professionalism on the part of their DP manager or what is referred to as "promotion to the point of incompetence."

When DP managers begin to act as professionals, we can expect to be treated as professionals by management and vendors alike.

Giff Babcock
Data Processing Manager
El Paso, Texas

APL Model Not Limited To Similar Terminals

Ron Frank's timely article on APL-Ascii [CW, Nov. 29] gives Jim Ryan and me too much credit. The six new APL characters were chosen by the APL Users' Group, and both this group and the Share APL project support APL-Ascii as a standard.

The APL model of the Teletype 38 is not limited to talking only to other similar terminals, as the article reports. It is true, however, that the Model 38 follows neither the proposed APL-Ascii standard *nor* the Ansi keyboard standards that Teletype Corp. helped establish.

For terminal manufacturers, the significant advantage of APL-Ascii is that it requires *no* change to terminals other than switching the type head or ROM used to generate graphics.

A paper describing APL-Ascii is available from Scientific Time Sharing Corp., 7316 Wisconsin Ave., Bethesda, Md. 20014.

Lawrence M. Breed
Vice-President, Development
Scientific Time-Sharing Corp.
Palo Alto, Calif.

This Competition Is Stifling

In Dan McGurk's response to my viewpoint article, he states that I appear "to believe that competition will not be stimulated by having more companies competing . . ." And, in that, he is absolutely right, but only when that competition is *artificially* created instead of being based on competence and upon supply and demand.

I did not state, however, that "the only way to be competitive . . . is to have extensive government support of a single corporation." Quite the contrary. I was concerned, in my article, about government hampering a single corporation.

My comments regarding government support clearly referred to industry support, not the support of a single company.

He correctly asserts that I ruled out "companies like GE, Sperry Rand and Xerox from. . .providing effective competition. . ." This is a statement of fact, not of opinion. I did not say that this was because they are "apparently too small." Size has nothing to do with competence.

It would require more space than allowed here, but it would be highly informative (especially to the Justice Department) to discuss each of these companies' failure to compete.

The very fact that IBM has been under government surveillance for 40 years without being convicted demonstrates the "merits" of the position of the Department of Justice.

McGurk is right. Data is difficult to acquire. However, if he is correct in estimating that IBM earns 95% of all the profits generated by the computer industry, then, since over half of these profits comes from foreign sales, it is definitely our most competitive force overseas.

Confusion exists because it is a confusing subject. No one has all the facts. However, with regard to misjudgments, all judgments so far are misjudgments. Judgments are made by the courts, not by armchair lawyers.

David E. Ferguson
President
Group/3
Los Angeles

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Earlier this year, we picked twenty-five 3200 fci premium tapes at random and tested them for output.

The tapes were by BASF and four other major makers. The criterion was the National Bureau of Standards Amplitude Reference Tape.

Test results? BASF/2000 A.D. was far and away #1 in uniformity – bit to bit, reel to reel.

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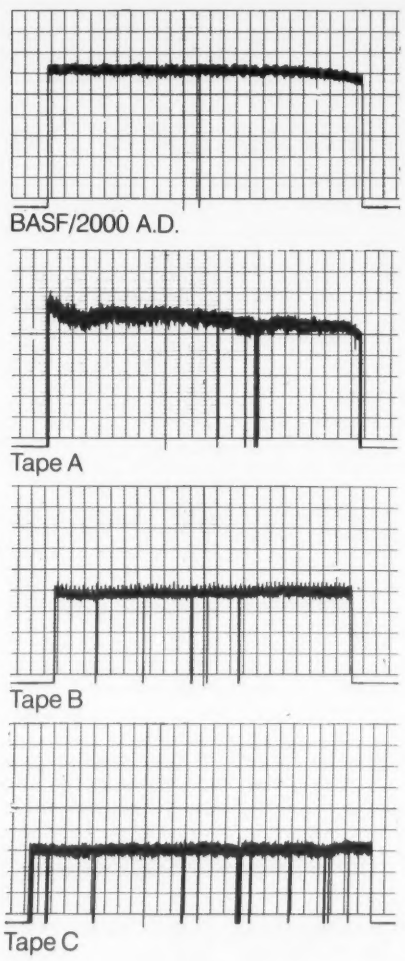
If you look right, you'll notice four typical charts and traces from the test. You can see others in a special booklet we've just prepared. (It's yours for the asking.) You'll also see the *reason* for our double win:



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BASF

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Random Notes

Facility Stocks Controlled On H200/2000 CPUs by 'PMS'

WELLESLEY, Mass. – Honeywell Information Systems has introduced a Purchasing Management System for 200/2000 series CPUs used in a distribution or manufacturing environment. PMS relates to procuring parts, materials, machines, tools and services needed to equip, maintain and operate a facility.

The system has four subsystems – vendor, purchase order, buyer and purchase order maintenance – and typically requires a CPU with 32K characters of core, three disk drives and unit-record I/O gear. It is available without charge to users of leased or purchased mainframes, the company said.

Statistical Data Supported

BETHESDA, Md. – Business managers can transform, sort, manipulate, analyze and display statistical data taken from stored files or entered at run time, with the Statsystem service now on the General Electric remote-computing network.

The service supports simple or multiple regressions, exponential smoothing, reliability analysis, confidence limits and polynomial curve fitting. It can generate bar graphs, histograms, frequency tables or other report formats. It is available through local dial-up to any of the 250 cities served by GE.

PAC I Adds Priority Facility

KING OF PRUSSIA, Pa. – A new feature on the Project Analysis and Control system (PAC I), from International Systems Inc., enables users to create a priority network of tasks and projects on their existing data base. Through simulation, it forecasts the impact of any changes in time- or resource-dependent priorities.

The feature is available immediately to new users of the $9,250 PAC I system, which has been implemented on various CPUs including IBM 360s, Burroughs and CDC equipment. The feature will be included in the 1973 enhancement agreement for current users, the company noted from 150 Allendale Road, 19406.

Cews Aids Contractors

ST. LOUIS, Mo. – The Contractor's Early Warning System (Cews), on the McDonnell Douglas Automation network, uses simulation to help a user anticipate situations before bidding on construction work, or to be aware of possible cost overruns soon enough to adjust a bid once it has been made.

Cews is available as a service run by McDonnell for $200 for each case plus machine time costs. Users with more extensive needs can have the service for $750/mo regardless of how often it is used. It can be installed on a user's own OS-based 360, a network spokesman noted.

Seen as Planning Tools

Systems List Cross-Program Data Use

By Don Leavitt
Of the CW Staff

Complete data base management systems may be either inappropriate or just overwhelming for some users to use or evaluate effectively. A new range of data control support packages, however, may provide users with another alternative.

Two packages have been announced recently, each designed to help the user know in detail what data he has available or will need in order to implement a new application. Neither provides an I/O interface with the data, as do data base management systems; instead both allow the user to list and cross-reference his data needs, primarily for planning purposes.

The Computerized and Manual Data Definition (Commandd) system from Software Unlimited Inc. uses the power of the CPU to give the user listings of data, programs and reports that use the various fields. But it is effective only to the extent that the user manages the manual phase of logging the data onto the system in an orderly and timely fashion, using the forms provided.

Simulate Data Structures

The Data Catalogue package from Synergetics Corp. also provides cross-reference listings, to avoid redundant data fields wherever possible, but goes further than Commandd in support of planning. It allows the user to simulate alternate or proposed data structures.

The Data Catalogue also requires timely entry of information in order for the reports to be most useful, but from the set of descriptors available to the user, the package in effect allows the installation manager to impose data standards which would be "automatically" enforced, according to Synergetics.

Operationally, this means that whenever a change is made to a cataloged item, the system generates a list of all programs that must be amended.

Centralized Listings

Under the Commandd system, the user gains control not only of what data fields he has or needs, but centralized listings of what reports are generated using specific data and what programs perform what processes on the data. This might show a manager that a newly proposed project would duplicate work that is already being done elsewhere in his workload, a spokesman for Software Unlimited noted.

Commandd also supports a tape backup, recovery and selection system for the users' program source decks. It will support all the major languages currently available, and can be used in conjunction with IBM's Information Management System (IMS/360).

The Data Catalogue allows data fields to be defined independent of their being structured into a hierarchy. This facility enables the designer to decide on the structure after he knows what the data is and how it is to be used, perhaps by several different programs.

Both these data support packages operate in an OS/360-370 environment.

Commandd sells for $15,000. Software Unlimited is at 63-84 Saunders St., Rego Park, N.Y. 11374.

Synergetics, at One Garfield Circle, Burlington, Mass. 01803, sells the Data Catalogue package for $6,500.

AED Gains Character Handling, I/O Support in Compiler Update

WALTHAM, Mass. – With the introduction of version 3.09, Softech Inc. has enhanced both the systems programming capabilities and application level support provided by its AED language compiler, which runs on IBM 360/370 and on CDC 6000 series equipment as well as a number of minicomputers.

Although AED remains primarily a systems programming language, often compared to IBM's PL/I, it has been changed with the new release to make it more suitable for applications where manipulating, comparing and moving character data are important.

Version 3.09 has also included additional I/O facilities, improved error-reporting procedures and a modernized character set for 360 users. The character set now is the same as that used in the IBM 360 version of PL/I, Softech noted.

The new I/O facilities allow the high-level language user to access the data management macros provided by IBM through CALL statements. This means, Softech explained, that the AED user has facilities comparable to the specific Read and Write macros under IBM's Bsam or the Get and Put capabilities of Qsam.

Character Pointer

The latest AED includes what Softech refers to as character-pointer capabilities in addition to the data-pointers it has had previously. Now the user can start operations at a specific character within a data field, or search for a specific character without concern for the rest of the data field.

Though this is comparable to character string manipulation, it differs from that facility in that the length of the field being searched or otherwise manipulated is not a part of the AED-provided data structure. The user has to define the number of characters to be searched, compared or moved, Softech said.

The new compiler is described as significantly more reliable than most currently available language processors. In addition to not producing bad object code from good source code, the compiler is forgiving of minor source errors and will interpret them in the light of the context, Softech said.

AED requires a 150K byte region under OS/MVT, the spokesman added. The compiler, originally developed under contract to the U.S. Air Force, is available for $15,000, including one year of updating and support. After the one year, support costs $500/ mo.

Softech is at 391 Totten Pond Road, 02154.

Package Adds Zips, Other Codes

ELMHURST, Ill. – Users of large name and address files can gain spelling corrections of city names, new sort keys and current Zip Codes with a single pass of Zap, a parameter card-controlled, table lookup system now available as a service or as a software package from List Processing Co.

Zap works with fixed-length records up to 300 bytes long, and adds 91 bytes to the original record length. The extension includes corrected spelling, if needed, of the key city or town in the base record, the Zip Code for that city and county and state codes based on a code scheme previously proposed by IBM.

Zap handles each record independently and requires no preprocessing, sorting or reformatting of files being handled, as long as the key field or fields are in the same logical position on each record.

The system adds the proper Zip Code for any city or town but goes even further, "zipping" according to street address, building or post office box numbers within multi-Zip cities.

The software requires a minimum of 54K bytes of storage and two or three 2314 spindles and has been implemented under both OS and DOS/360.

Written in Cobol, the system has been adapted to Burroughs and NCR as well as IBM equipment. The package is available on a five-year lease plan for $22,000, which includes source code, quarterly updates of Zip Code zoning from the post office and any system enhancements from List.

A one-year lease plan, for $10,000, is also available, but does not include updates or enhancements, a spokesman said. List will do the processing for prices ranging from $16/thousand Zips found (up to 125,000), to $9.75/thousand found if more than a million are coded.

List is at 683 Larch Ave., 60126.

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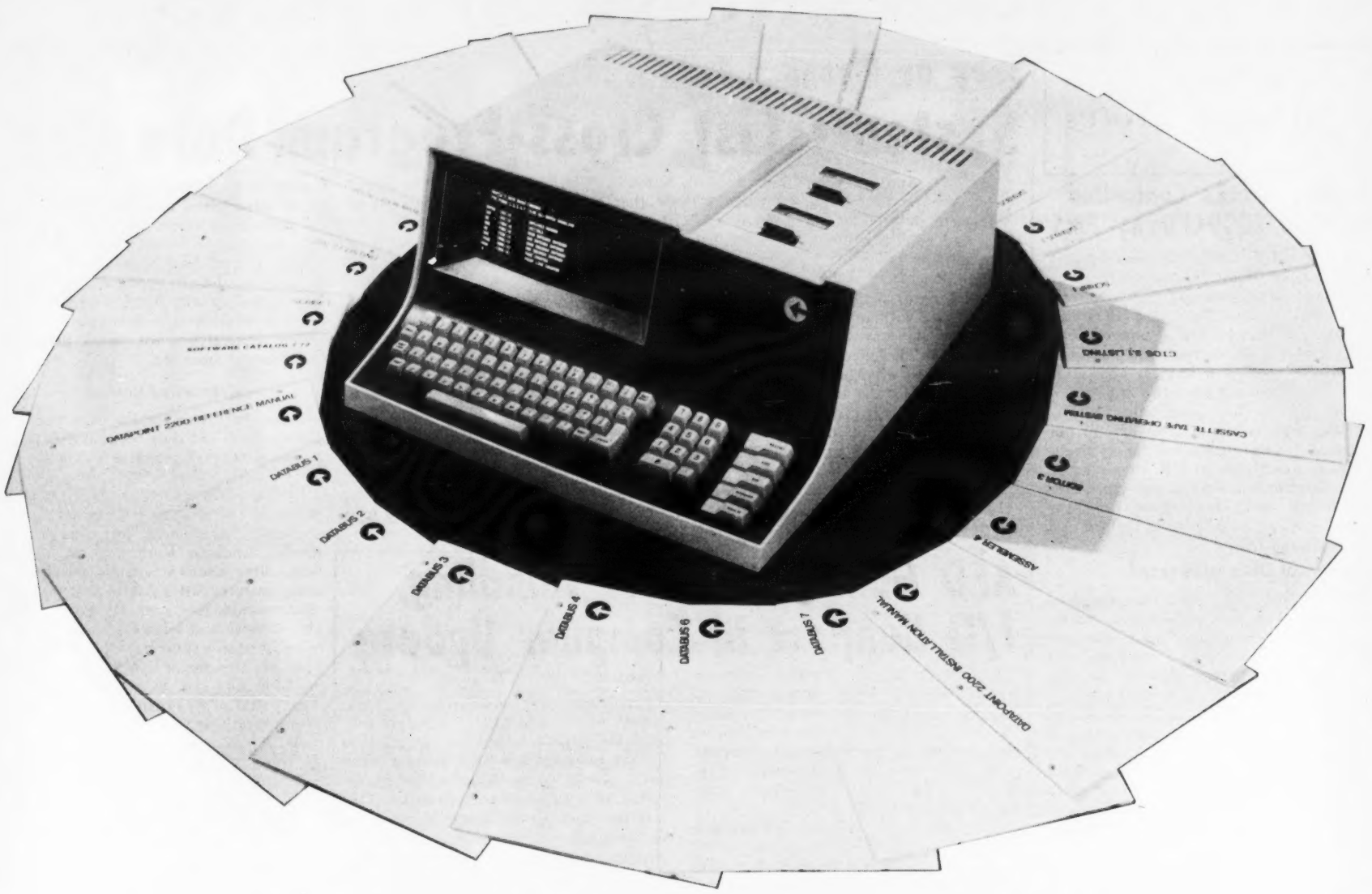

Other mini computer manufacturers talk about their software: Datapoint delivers

The Datapoint 2200, a unique combination of powerful computer, display, and dual cassette drives, has established an enviable record as an all-purpose computer and communications system. Its success, however, is not based on hardware capabilities alone.

Many computer professionals have been pleasantly surprised to discover that the Datapoint software catalog makes available more comprehensive offerings of program-generation software than most other mini computer makers. And all the programs are created and run on the Datapoint itself — no other computer is required.

Here's a selection of available Datapoint software:

OPERATING SYSTEMS

DOS — A powerful Disc Operating System based on the 2.4 megabyte cartridge disc.

MTOS — An operating system based on the Industry-compatible magnetic tape.

CTOS — For stand-alone operation, a powerful cassette-tape operating system.

DATABUS, A HI-LEVEL LANGUAGE — Databus, the Cobol-like Datapoint Business Language, was written especially for the Datapoint. The language contains comprehensive character and arithmetic capabilities. While programs may be written quickly in English-language statements, its real power lies in its ease of I/O operation. Tapes, disc, and printers are handled in Databus as well as communications peripherals.

SCRIBE, A TEXT PROCESSING LANGUAGE — The combination of a Datapoint 2200 plus an upper and lower case printer can form the heart of a text-processing system. The SCRIBE program, actually a high-level language, allows text to be entered via the 2200's keyboard, visually edited and stored on a cassette tape. Upon command, this stored text may then be printed on a Selectric typewriter or on any Datapoint printer.

ASSEMBLY LANGUAGE PROGRAM GENERATION — Machine Language Programs are quickly constructed by use of the Editor, Assembler, and a selection of Debuggers.

TERMINAL EMULATORS — Datapoints can simulate many well-known terminals and offer a multi-purpose alternative to a user. A variety of Terminal Emulator programs are available with many of the packages offering more flexibility than the original, yet maintaining the required discipline. Recent terminal packages include an IBM 2780, CDC 200 User Terminal, UNIVAC DCT-2000 and UNITERM, a flexible teletype-format emulator.

UTILITIES — Many sub-routines and other useful software items are available for the applications programmer. I/O drivers, communications, fixed and floating point arithmetic and a variety of other routines are available as well as a complete set of diagnostics.

This proven-in-use software capability is a big reason for the success of the Datapoint 2200 as a versatile computer or data terminal system in more than 1000 installations. Prices for the Datapoint 2200 begin at $6040 with a variety of lease and purchase plans, with worldwide maintenance available.

For more information, contact your local representative or the home office of DATAPOINT CORPORATION. That's right — we've changed our name from Computer Terminal Corporation to reflect more adequately our growing involvement in a wide range of data processing systems, services and software. DATAPOINT CORPORATION, 9725 Datapoint Drive, San Antonio, Texas 78284 (512) 696-4520.

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COMMUNICATIONS

Data Briefs

Monthly Rate Hike Set For WU Data TTY Rates

MAHWAH, N.J. – Western Union Data Services has notified its teletypewriter customers that it plans to raise rates on Model 33 and 35 TTYs from 3.5% to 6% beginning Jan. 1, 1973.

The hike is subject to Price Commission approval but will apply only to monthly contract customers, a spokesman said. Customers who convert their agreements to a one-year term will remain at the same rates.

On Model 33 TTYs with DAA, ASR originate/answer capability, the rate will jump from $70/mo to $74/mo. On a Model 35 with the same features the price will be $138/mo compared with the previous $130/mo.

4-Wire Term Sets Unveiled

FALLS CHURCH, Va. – Pulse Communications Inc. has 4-wire term sets to convert signals transmitted over 4-wire circuits to 2-wire circuits.

A typical application would be where a 4-wire loop was terminated into a 2-wire link for entrance into a PBX, a spokesman said.

Designated the 1677, the unit provides for amplitude equalization on both transmit and receive. The unit costs $65, from 5714 Columbia Pike, 22041.

Character Generators Available

PLAINVIEW, N.Y. – Video Data Systems Inc. has a series of character generators that can be configured into a full CRT display system with the addition of a standard video monitor.

The 512-character memory is arranged in 16 lines of 32 characters and two data input sources can be accepted for split-screen display. The character generator costs $995. A system with included keyboard costs $1,650. Delivery is 30 days from 34 Sylvia Road, 11803.

Casebook Covers Net Design

CAMBRIDGE, Mass. – ADL Systems Inc. has a "casebook" on data communications network design which describes many of the trade-offs that must be considered by the computer/communications user. The booklet describes the major factors which directly affect system performance. Although it is not a detailed work, the casebook does make communications users aware of the factors which they must consider. The company is at Acorn Park, 02140.

Device Has Vertical Tabbing

SOMERVILLE, Mass. – National Data Industries has added the Model 9030 teleprinter to its line of terminal equipment. The device includes a vertical tabbing feature that allows top-of-form formatting. The unit costs $3,440 from 59 Union Square, 02143.

Separate Phone Rate?

IDCMA Challenges N.Y. DAA Rates

By Ronald A. Frank
Of the CW Staff

ALBANY, N.Y. – A case currently being considered before the New York Public Service Commission (PSC) could go a long way in simplifying the installation of Bell's Data Access Arrangements and in reducing their costs.

The case is based on a complaint by the Independent Data Communications Manufacturers Association (IDCMA) that a user should not be required to pay for a telephone with each DAA he leases from New York Telephone Co.

In its order for a hearing on the complaint, the PSC said the sessions would "determine the correct and proper method of calculating rates and charges for the provision of data access arrangements."

Case Last Year

In a similar case last year the Southern New England Telephone Co. (also a Bell System company) agreed to change its intrastate charges so a customer did not have to pay for a phone he did not need.

The earlier case in Connecticut resulted in the telephone company's granting the user a credit of $1.10/mo when using either a CBS or CBT DAA without the telephone. This credit was initiated by the phone company so the complaint was never carried into a hearing.

But the New York complaint goes well beyond merely the amount charged for the DAA. The IDCMA has said that the access arrangement is unfairly priced, that it is a relatively simple device and that it has been made unnecessarily cumbersome by Bell.

At an initial hearing on Nov. 28, IDCMA said that a telephone "is not necessary for normal operation of the automatic DAA. In applications involving multiple lines or in a computer room, it can be counter-productive."

At the hearing IDCMA argued that the entire question of the DAA, its price and the need for the device should be discussed. But New York Telephone said the issue should be restricted simply to the telephone company charges for the device.

Briefs Planned

At the request of the hearing examiner, both parties will file briefs defining the scope of forthcoming hearings. One communications expert said "this case could become one of the most important interconnection challenges yet brought before a regulatory commission."

In prepared testimony at the hearing, Dr. Dixon Doll presented the IDCMA position. "The user of non-Bell System data sets and other interconnect equipment is penalized both economically and technically by having to use DAAs for data transmission over the public switched network," he said.

If the commission examiner should decide that these charges must be considered, the outcome would be important for all users of independent data equipment.

Independent Terminals, Control Unit Simplify Student Service

BLOOMINGTON, Ill. – Non-impact printing terminals are helping students at Illinois State University interact with a 360 computer as part of their instructional experiences.

The school's department of computer services installed four NCR 260 data terminals at the beginning of this year. The terminals were controlled by a Memorex 1270 front end which replaced an IBM 2701.

The 260s operate at 30 char./sec which was two to three times faster than the previous impact printing terminals installed at the school. Used with the 1270, the terminals cost $540/mo less than another terminal configuration which the school had considered, according to Bud Clark, assistant director of computer services.

The 260s transmit their data to a 360/50 which includes 512K of storage, Telex mag tape units and Memorex 2314-type disk drives. By selecting the independent peripherals, "we were able to upgrade at lower cost than if we had gone with IBM," Clark said.

The entire terminal operation is controlled by IBM's Interactive Terminal Facility which Clark described as limited in its sophistication. One of the improvements he would like to see is additional capability to store programs off-line on disk storage.

The Model 50 is dedicated to running student jobs most of the day. A special instructional session gives students enough Basic language information to interact with the CPU. In addition, classroom instructions and assistance at the terminals help familiarize the students with the CPU.

A special "quick turnaround room" at the DP center is available to give students fast service on short runs which require limited CPU time. "Students punch their program decks on an 029 keypunch and we give them a printout in a minimum of time," Clark said. The room contains a printer and card reader for fast jobs, he added.

In addition to students who access the 360 simply to augment their class studies, some are doing extensive research on theses or similar projects, Clark said.

Among the student programs available on the 360/50 are mathematical routines that perform linear regressions, calculate mean and standard deviations and evaluate the difference between two groups of means. Students presently write their own programs in the fields of business, accounting, physics, chemistry, psychology and other disciplines with the help of the interactive terminals.

Data Needs Expected to Migrate From City to Village, Usita Says

WASHINGTON, D.C. – "There are still too many telephone companies with their heads in the sand who cannot or will not believe that data transmission [will come] . . . to crossroads and villages as well as . . . cities and metropolitan areas."

This evaluation of the future of telecommunications was contained in a report submitted to the U.S. Independent Telephone Association (Usita) by its data communications committee.

Usita phone companies must be prepared to offer data services to subscribers and maintain these services, the report said. And Usita member personnel must be educated to "talk intelligently" to subscribers who want data services, the committee said.

To enforce the importance of education in the data area, the committee emphasized the communications course at Iowa State University. Under the sponsorship of the school and Usita, a winter session will be held from Feb. 26 to March 9, 1973, to train Usita members and industry users in data communications fundamentals.

The course was initiated in 1967 by Usita and since then more than 200 students have attended the sessions, according to Tyler Ryan, Usita president. Although primarily begun for telephone personnel, the course is open to others interested in the two-week course.

Included are communications engineering concepts, equipment functions covering data sets and data access arrangements and computer fundamentals.

Information concerning the course is available from Dr. Richard Horton, 306 Coover Hall, Iowa State University, Ames, Iowa, 50010.

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COMPUTERWORLD
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Bits & Pieces

MICR Printing Units Enable Off-Line Use

SANTA ANA, Calif. – Troy Computer Products is offering two Magnetic Ink Character Recognition (MICR) printing systems for off-line operation.

The 200M is designed as a direct replacement for the IBM 1445 and offers a print capability of 200 line/min for alphanumeric, special and MICR characters, a spokesman stated.

The 400M is a two-pass system and prints only MICR characters at 340 line/min.

The major user advantage of these systems is the ability to operate off-line, thus avoiding the need to interface with a time-sharing service or an internal CPU, the spokesman added.

Both MICR systems are user programmable and come with operating software for less than $60,000.

The firm is at 2322 Pullman St., 92705.

Terminal Series Expanded

ARCADIA, Calif. – Western Telematic Inc.'s CT series of punched-card terminals has been expanded to include all standard terminal rates and codes to 120 char./sec, a spokesman stated.

Connected "transparently" between the display terminal and its data set, the CT series reads both program and data cards under CPU control.

Priced at $4,175 and leasing from $135/mo, the units are available from Box 1370, 91006.

OCR Made for Low Data-Entry User

DALLAS – Recognition Equipment Inc. has brought out a new Optical Character Recognition (OCR) page-reading system for the "lower-volume data entry market."

The Input 80 Model C single-font system comprises two tape drives, line printer, teletypewriter and 16K-word CPU. The single-font system can be upgraded at a user installation to multifont capabilities, the firm stated.

Price for the single-font system is $259,250 with a lease of $6,275/mo. Multifont systems start at $296,490 or lease for $7,175/mo from P.O. Box 22307, 75222.

Price Drops on PDP-8/L Add-Ons

FAIRFIELD, N.J. – Digital Computer Controls has reduced the price of ME-1 core memory expansion units for the PDP-8/L.

The initial 4K increment is reduced from $3,500 to $2,700. Additional 4K add-ons have been cut from $2,375 to $1,900.

Prices include field installation, on-site testing and a 90-day warranty from 12 Industrial Road, 07006.

Upgrade for Users of 200s

2 Models Extend Honeywell 2000 Line

By Michael Weinstein
Of the CW Staff

WALTHAM, Mass. – Honeywell has added two computers to the low end of its disk-oriented Series 2000 line.

The models 2020 and 2030 fit between the Model 58 and Model 2040 and are designed to compete on a price performance basis with computers renting from $2,000/mo and up – e.g., IBM System 3, Burroughs 1700, NCR 50 and Univac 9200, a firm spokesman stated.

Within the Honeywell line, the new systems are provided as natural upgrades for current users of Series 200 computers, he added.

Also introduced for the new units are a magnetic tape subsystem and a 450 line/min printer.

The Model 2020 is an entry-level computer with a basic main memory of 24K characters that can be increased in six increments to a maximum of 65K characters. Basic cycle time is 2.75 msec/char. with a speed-up option to 2.5 msec for users with type 275 disk pack drives.

Three read/write channels are standard; a fourth is optional on larger 2020 models.

Primary software is the Mod 1 (MSR) operating system.

The 2030 is a small-scale computer designed to provide multiprogramming capabilities.

Main memory is 40K characters expandable in five increments to a maximum of 98K characters. Cycle time is 2 msec/char. and six read/write channels are standard.

The unit is designed primarily for multiprogramming using the OS/2000 multiprogramming operating system, but is equally effective when the Mod 1 (MSR) operating system is used, the spokesman asserted.

Both the 2020 and 2030 are designed as disk-oriented systems, but a special magnetic tape subsystem including three tape drives and a controller has been released to operate with these computers.

Three Versions

This tape subsystem is available in three versions: the 204B-200 with 10 kchar./sec transfer rate; the 204B-300 with a 20 kchar./sec transfer; and the 204B-400 with a 30 kchar./sec transfer rate.

Packing density on all units is 556 bit/in. with 200 bit/in. optional, the spokesman said.

The 112-2A printer operates at 450 line/min over a 132-column line. The Honeywell spokesman stated this offered a printing speed not previously available to Honeywell general-purpose computer users except educational institutions.

Both new units can process programs written in Cobol, Fortran and Report Program Generator (RPG) under control of the Mod 1 operating system, the spokesman noted.

Honeywell's Liberator/20 software is also offered for IBM 360/20 users and other RPG users to convert to the 2000 series, the spokesman added.

Prices

A minimum 2020 configuration leases for $2,072/mo on a five-year contract – $2,341 on a one-year lease – or can be purchased for $96,000. This system includes a CPU with 24K-character memory, card reader/punch, 450 line/min printer and two disk subsystems for storing 9.2M characters of data.

Disk-oriented 2030 is designed to provide multiprogramming capabilities.

Minimum Configuration

Minimum configuration for the 2030 leases for $4,447/mo on a five-year lease – $5,085 on a one-year lease – and sells for $196,170. Included are CPU with 41K-character memory, card reader/punch, console, 650 line/min printer and disk subsystem to store 18.4M characters of data.

Companion tape systems rent for $620/mo, $760/mo and $880/mo for the 204B-200, 204B-300 and 204B-400 respectively.

The 112-2A printer leases for $615/mo on a five-year lease or $692 on a one-year lease and sells for $26,820.

All units will be ready for delivery early in 1973, the spokesman concluded.

Linc Tapes, Operating System Give Users I/O Paper Tape Option

By Don Leavitt
Of the CW Staff

BELTSVILLE, Md. – Hewlett-Packard Series 2100 mini users can now get away from paper-tape I/O and access at high speed up to 1.6M words of disk-like space for systems software, application programs or data, with Linc magnetic tape units and a new operating system from Computer Operations Inc. (COI).

The effectiveness of the system is based on the use of the premarked Linc tapes which unlike "industry-compatible" half-inch magnetic tapes, allow the user to address specific tape locations much as is done with disk operations. Once positioned, users can transfer data (or programs) from the tapes at 2,400 byte/sec, according to COI.

Linc tapes are identical to the "Manchester-coded" Dectapes used on many of the Digital Equipment Corp. minis, COI explained.

In effect, the new operating system optimizes the use of standard HP system software for this high-speed I/O environment.

It includes a new executive system and an editor using commands identical to those of the HP editor. It also provides an assembler language processor, a Fortran compiler and support for read/write function via CALLs from within Fortran programs.

A Basic facility, already available on the HP machine, is enchanced by including storage of programs on the Linc tape so they may be merely loaded and need not be reentered from the console typewriter each time they are to be used.

Plug Compatible

Linc tape units from COI are plug compatible with the HP 2100 series hardware and cost $4,350 for a single drive master system, providing 100K words of storage. An additional slave drive, required for use of the operating system, costs an additional $1,700.

The operating system is free with all Linc tapes supplied for HP machines, COI said. Both the tape units and the software are available immediately, the company noted from 10774 Tucker St., 20705.

Nova Gets Matrix Printers

SOUTHBORO, Mass. – Nova minicomputer users have a choice of two dot-matrix line printers from Data General Corp.

Both printers have a speed of 165 char./sec and print 10 char./in. with up to 132 char./line.

The 5 by 7 dot matrix printer has a 63 character set and is priced at $4,500. The second model, priced at $4,900 has a 9 by 7 dot matrix and a 64 character set.

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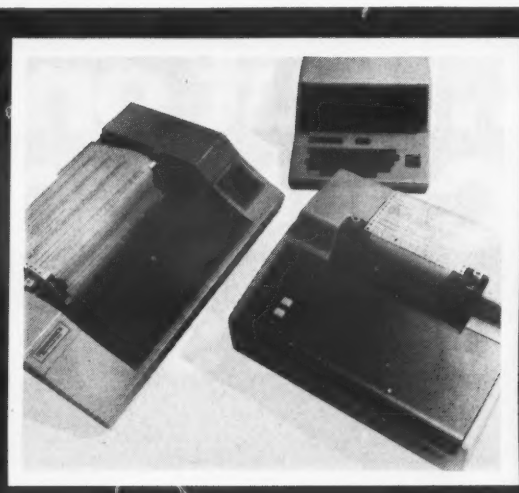

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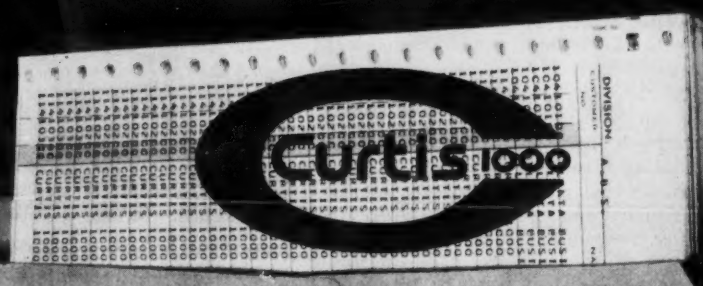

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ACM Recruiting Stresses Relevance to Business DP

By Edward J. Bride
Of the CW Staff

ANAHEIM, Calif. – Increasing activity in the certification arena, plus new overtures to business programmers to join, are in store for the Association for Computing Machinery (ACM), officers said here recently.

The member-officer forum held during the Fall Joint Computer Conference brought an explanation of the group's near-term plans in the educational/certification area, and of possible plans to ease the continuing financial crisis.

Societies/ User Groups

John Hamblen, educational director, predicted much activity toward establishing a curriculum for a Masters Degree for business data processing, an area where ACM has not made inroads for membership.

He said a proposal last spring for such a curriculum would generate as much activity as the Bachelor's Degree program, called Curriculum '68.

Hamblen also was pessimistic about the establishment of a separate certification body, but rather predicted cooperation with other societies as the way to accomplish professional certification programs.

Problem of Economics?

Hamblen was not clear on whether he was predicting failure of the proposal for a joint certification foundation with the Data Processing Management Association (DPMA) [CW, Oct. 11], but he said "economics may keep us from moving too far in that direction."

Prof. Anthony Ralston, president of ACM, said that in the next five to 10 years, the association would indeed cooperate with many other societies. There is a "thrust" in ACM, Ralston said, toward increasing concern over professionalism, but he declined to predict the outcome of this interest.

Licensing and certification are coming to the programmer, Ralston said, adding ACM should be involved in the establishment of these licensing or other regulating procedures, rather than being strapped with educating members on a program that evolved without ACM help.

Even so, ACM is not considered a "professional" society, but rather a scientific/technical/educational one, he noted. There was a suggestion that a move toward becoming a professional group could cost the association its tax-free status, but there was no conclusive statement on the possibility.

Insiders Dominate Meeting

The member-officer forum was attended by around 25 persons, half of whom were ACM Council members or who held "key committee positions," noted Jean Sammett, vice-president of the association.

Members were critical of a lack of publicity for the meeting, although it appeared in the ACM monthly magazine, *Communications,* and in trade journals.

The overwhelming majority of attendees nonetheless felt the meeting was worthwhile, and indicated it should be attempted again, either during the National Computer Conference in June, or possibly at the ACM national meeting in August.

The audience was less united on the certification issue, however. One member called the Certificate in Data Processing (CDP, controlled by DPMA and being considered for cooperative effort by DPMA and ACM) "absurd." A simple test is not sufficient for certification, he claimed.

Another member said the analogues between programming and other professions are not so simple that ACM can go forward on certification.

About Membership

There was little amplification on certification, with the discussion then turning toward the size and potential membership base for the organization.

Ralston claimed ACM has as broadly based a membership as any society, but turnover is a problem. New members each year are nearly balanced in numbers by those who do not renew, which stifles growth, he acknowledged.

Bill Konigsford, a former membership chairman, said ACM draws well from the people to whom it is relevant, adding the ACM turnover problem is bigger than with other groups.

"There is a large data processing segment," he said, "to whom there is no relevance" in ACM, and that group is the business programmers and analysts.

Ralston said it was the position of this ACM administration, as with other past officers, that "we really would like to increase our service to business data processing, but we really don't know how to do it right."

Hamblen added that progress had been made in the last year in enticing business programmers to join, and he cited the proposal last spring for the Master's Degree as one device that could continue this trend.

It was also suggested to the officers that corporate membership should be sought, to help decrease the continuing financial problems of the group. Corporate memberships are available for $1,000, and there are currently 22 companies supporting ACM with this program.

However, before new companies can be added to the list, Smith said it must be proven to these companies that they can benefit from membership. He also said it was important to remain independent from companies, and he said the group could benefit from advertising and exhibit dollars, which come with "no strings attached."

The ACM council has nonetheless been asked to approve a local corporate membership, to help local chapters in their activities.

Manufacturer Board Formed

WASHINGTON, D.C. – A manufacturer's liaison committee has been formed by the National Retail Merchants Association (NRMA) to assist the retail industry in developing voluntary standards.

COMPUTER INDUSTRY

CI Notes

Travelers Exits 360 Field

BOSTON – First National Boston Corp. will be entering the IBM 360 computer leasing business, while Travelers Corp. will be dropping out, according to recently announced merger plans between the two.

Travelers Corp., which is selling the 360 assets of Randolph Computer Corp., indicated it wanted to get out of the 360 leasing business because "an economic evaluation showed this operation was no longer as attractive as when we first acquired it."

Because of this, Travelers will sell Randolph's 360 inventory to First National, a bank holding company, for about $61 million in cash and notes, the firm said, off from the $100 million value previously put on the inventory.

The 360 assets to be acquired represent about 70% of the total assets of Randolph which will continue to lease IBM 370 equipment and peripherals.

Data General Dymo Deal

SOUTHBORO, Mass. – Data General is getting into the point-of-sale market by manufacturing and selling a POS system developed by Dymo Industries of Berkeley, Calif.

Under an agreement between the two firms, Data General will continue to develop and sell the POS system designed by Dymo for supermarket stores. Dymo will manufacture and supply the label-imprinting devices and labeling supplies used in the system.

Data General is paying $500,000 for the system, with $200,000 now, and the rest in 18 months. It will also pay royalties to Dymo of between 3% and 6% depending on the number of systems sold.

Xerox Orders From Itel

SAN FRANCISCO – Xerox Corp. has ordered a minimum of $15 million worth of office equipment from Itel Corp. The equipment will be produced at Information Storage Systems, Itel's manufacturing subsidiary, and delivery is scheduled to begin in May and extend over 18 months.

Supershorts

Mohawk Data Sciences Corp. and Computing Efficiency, Inc. (CEI) have jointly received a $5 million contract from Burroughs Corp. for the purchase of Model 4000 magnetic tape transports. Bucode, a wholly owned subsidiary of CEI, will supply units for domestic requirements, while MDS-International will furnish identical units for Burroughs overseas requirements.

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SE Laboratories of Middlesex, England, has been chosen exclusive British representative by modem maker Rixon Inc., Silver Springs, Md.

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Digi-Data Corp., tape drive manufacturer, has broadened its marketing policy from factory-direct to regional representatives, and has selected S & S Electronics as its New England representative. S & S will also handle sales of Princeton Electronic Products graphic display terminals.

– – –

Collins Radio Co. has restructured its service organization as part of a major plan to expand its activities in the service business.

– – –

NCR plans to build a $6 million production facility near Wichita, Kan., to house manufacturing and engineering activities for small computers, including the NCR 399 series and the NCR 725 "in-store" computer for retail stores.

Describe Architecture Changes

Designers Agree: User Needs Slighted

By a CW Staff Writer

ANAHEIM, Calif. – Integrated circuit technology will allow more and more functions previously given to software to be integrated into hardware in future computer systems, panelists here agreed recently.

At the same time, computer designers agreed that more attention should be paid to discovering the true needs of the user before embarking on computer design projects.

Many of the tasks of the past should be reexamined, T.C. Chen of IBM said, in order to discover what computer functions are best performed by hardware, software or firmware.

New Algorithms

Future computer systems, he said, should not be limited to performing only known algorithms, but should have some capacity for self-optimization or the ability to generate new algorithms to meet new requirements.

The future systems, he indicated, will have a reservoir of internally stored information to draw upon and will be able to decide whether old algorithms are the best way to perform specific functions or whether new algorithms should be designed for the job.

But, he indicated, large-scale integration at a reasonable price would be needed to give this type of capability to computer designers.

Ralph Conn of Ultrasystems indicated that in order to make extremely reliable and self-repairing computer systems, the designer should look primarily at the memory area of the machines.

Studies have shown, he said, that 62% of computer failures could be traced to the memory sector, while fewer were attributable to the central processor sector of a machine.

Therefore, he said, designers, while desiring the economies of large memory chips, should be careful when optimizing the memory sectors of a machine, because one chip failure could cripple the entire system.

Recent experiments, he said, have shown that computer systems with a 95% chance of complete unattended reliability for a five-year time span can be built at a reasonable cost, if the user is willing to pay the price.

Herb Grosch of the National Bureau of Standards, however, challenged the computer designers, claiming they were building systems for which there was no user need.

"We don't make what the user needs," he stated. "We force him to take what he doesn't need."

Noting the computer industry is not a science, but rather something between a "trade and a racket," Grosch said designers continually make systems smaller and faster, but they are actually harder to get at for the end user.

Chen countered, however, by urging users to make their opinions known to the computer manufacturers if they wish the mainframe makers to produce better systems.

In the past, he noted, one of the major problems with computer systems was in the area of operating systems and suggested some parts should be produced in hardware rather than in software.

Chen also indicated there is a possibility that future systems will decentralize operating system functions among many processors, thus making them more efficient.

Increased throughput can be obtained, he said, through a network of loosely coupled intelligent devices.

The questions of increased throughput and ease of use are no longer ones of technology, he indicated, but rather ones of commitment and resources on the part of the mainframe makers.

Study Sees Banking DP Market Tripling Within Next Ten Years

NEW YORK – The market for computerized systems in the banking industry will grow from the present $1 billion level to more than $3 billion within the next 10 years, according to the market research firm of Frost and Sullivan.

"By far the most important influence on the market for banking information systems over the next 10 years will be the transition to 'checkless' and 'cashless' transactions," the firm said.

"Banking is undeniably moving in this direction; the only questions are by what route and in what time frame," it added.

A recent survey of banks indicated that 25% of them expect the trend toward the checkless society to affect their automation requirements in the next two years, while 50% said they will feel the impact of such systems before 1977, Frost and Sullivan said.

Third Place

Because of this growth, the study said, the banking market will "rival that of all other electronic data processing submarkets, except those for medical and hospital EDP."

The two factors most responsible for the move toward paperless transactions, according to the firm, are the requirements of the Federal Reserve Board and the widespread use of credit cards.

"These cards provide the logical instrument for implementation of the new concept," the study said.

The percent of banking transactions that are presently on-line amounts to about 20%, the firm indicated, but by 1975 this should grow to 25% and jump to just over 50% by 1980.

Direct deposit of payrolls is the first step toward the cashless society and is already being used in some places, the report noted, as is on-line verification of credit cards.

By the 1974-75 time frame, there should be one-day clearance for all checks and soon after that most payrolls will be deposited directly. Following this will come multibank point-of-sale systems and same day clearance of all checks, the report predicted.

Two Data Entry Makers, Inforex and Scan Data, Announce Merger Plans

BURLINGTON, Mass. – Inforex will acquire Scan Data Corp. if an agreement in principle reached between the two firms is confirmed by the stockholders of each firm.

The merger, which could have a wide impact on the data entry business, calls for Inforex to issue one share of common stock to the Scan Data stockholders for every three shares of Scan Data common.

Based on the 1,621,451 shares of Scan Data outstanding, this would call for the issuance of 540,000 shares of Inforex common.

Both of the firms are in the data entry side of the business, with Inforex one of the leaders in the key-to-disk market and Scan Data entrenched in the optical recognition market.

Both have also recently introduced multimedia products that combine both the strengths of OCR with those of shared processors.

IBM Should Be Allowed to Grow Abroad, Be Limited Here: Wagner

NEW YORK – Government regulation of IBM that would limit its domestic growth but give it freedom to expand abroad is the only practical solution to IBM's dominance of the computer industry, according to Frank Wagner, executive vice-president of Informatics, Inc.

Speaking at an ACM-sponsored seminar at Pace College here, Wagner said IBM's dominance of the industry threatens the survival of all other computer manufacturers, independent peripheral makers, leasing companies and others in the industry.

Wagner said, however, IBM is less of a threat to software firms because most of IBM's business is in the hardware manufacturing business and IBM will concentrate on these areas of strength in protecting its markets.

Wagner said his suggestion that IBM be regulated at home but allowed to grow unhampered overseas might even be acceptable to IBM since the main part of its growth is in foreign markets.

"There is probably no sensible way IBM can be broken up, any more than American Telephone and Telegraph can be broken up," Wagner said, adding, "certainly the majority of computer users does not want to destroy IBM.

"However, since IBM has become a de facto monopoly and can virtually be considered a public utility, it should be regulated like a utility," he added.

"Doing so," Wagner went on, "will keep the computer industry in this country strong, while preserving the non-IBM part, that segment of the industry responsible for hundreds of thousands of jobs and much of the industry's technical creativity.

Under regulation, Wagner indicated, IBM could continue to operate effectively while others would be allowed to survive the next three to six years and offer effective and viable choices to computer users.

Wagner indicated IBM's dominance of the market is total at the present, but at the same time it is a subtle type of dominance.

"Not only does IBM have a great sales force, it has good products, good software, good support and overwhelming user acceptance," he said.

"The data processing manager buying or leasing equipment other than IBM is constantly on the defensive to prove he didn't make a mistake," he added.

"Additionally, IBM's success with its System 3 minicomputer is bound to dominate the small user market for business data processing; its countermeasures in the peripherals market, both in new pricing and new products, seriously threaten the existence of the small but heretofore growing fraction of the industry that supplies disk files, tape drives, add-on memories and other equipment to go with IBM systems; its new pricing policies make it less attractive for a leasing firm to buy IBM equipment and then lease it," Wagner concluded.

Absent for Two Years

Will Mainframe Makers Return to National Shows?

By Edward J. Bride
Of the CW Staff

ANAHEIM – Will the mainframe makers return to the exhibit floor of the national computer shows?

Some people think so and officials of the American Federation of Information Processing Societies (Afips) indicated the possibility exists.

At a recent press briefing, Dr. Harvey L. Garner, chairman for the 1973 National Computer Conference and Exhibition (NCC), noted the top three volunteers for the NCC are employed by IBM, Univac and Honeywell. This is indicative, Garner said, of the "commitment" of the large computer manufacturers to the NCC.

Bruce Gilchrist, executive director of Afips, commented that the major computer manufacturers are still evaluating the solicitations of booth salesmen, and he expressed some optimism that these companies might choose to exhibit.

The mainframes have been absent from the joint computer conferences for two years, with the exception of RCA, which showed major equipment in the spring of 1971. Major manufacturers have exhibited peripherals at the conferences, but not large processors.

Largest U.S. Show?

On other matters, Afips officials said the first NCC should attract between 30,000 and 50,000 computer professionals, possibly making the event the largest computer show ever held in the U.S. About a third of the 750 booth spaces slated for NCC usage at the New York Coliseum have been committed, Afips reported.

Responding to an inquiry concerning possible union problems in New York, Gilchrist suggested these problems have been alleviated in the past two years, adding the exhibitors did not appear concerned over the cost or the details involved in dealing with the many different unions.

Afips acknowledged their top priority has been planning the NCC and the required changes in site, dates and program. As part of the sessions – the term "technical program" is no longer used, Afips said – each of the 13 constituent societies will plan at least one meeting.

It is anticipated that the two divisions, Methods/Applications and Science/Technology, will each have 32 sessions, making a record total of 64. It is also anticipated, Afips noted, that the user-oriented applications seminars of the 1972 FJCC will be repeated in some form next June.

Paper Review

A new review procedure will enable the planning committee to screen papers at a much later date and within a shorter period of time than previously required. With the paper deadline Feb. 1, Afips said the final program will be announced March 1.

Carl Hammer, director of the Science/Technology portion, has about 500 paper referees willing to review one paper each, within ten working days of receiving the paper.

The split into two divisions is part of the Afips attempt at retaining the traditional JCC attendees, through the Science/Technology portion, and recruiting new attendees through the Methods/Applications division, being coordinated by Robert Bemer.

Part of the recruitment activity includes a precedent-setting discount to societies that are not members of the Afips community. Garner reported members of the non-constituent groups will be permitted to preregister at the membership rate of 50%, if the trade journals of the non-constituent groups publicize the conference.

Bemer suggested if a large company like IBM were on the fence regarding the decision to exhibit, and if the company "recommended" the addition of a particular session, "then I'm sure we could find a place for the session."

Attendees at the press briefing saw this comment as indicating a strengthened Afips orientation toward exhibits.

While some press members felt Afips was ignoring its technical and public-oriented activities, Gilchrist denied this, noting the federation was planning to conduct another survey on the public's attitude toward computers.

The Afips-*Time* study conducted last year has been used as a reference by many government agencies and committees, Gilchrist noted, but it may be time for an update.

Afips has also recently published a book on *Computers and the Problems of Society*, and the Social Implications Committee is planning many workshops to study this aspect of computer usage, Gilchrist noted.

Expansions

Wabash Tape Corp., a subsidiary of Wabash Magnetics, is doubling its facilities with the construction of a plant in Huntley, Ill.

Rolm Corp. has moved to a new 25,000-sq-ft facility in Vallco Industrial Park, Cupertino, Calif., to provide more space for manufacture of its Ruggednova line of minicomputers.

Cambridge Memories, Inc. has acquired a 62,000-sq-ft facility in Concord, Mass., for headquarters and manufacturing.

Terminal Communications, Inc. opened a manufacturing facility near Longview, Texas, which will provide subassemblies, power supplies and cables for use in the Raleigh, N.C., plant.

Systems, Science and Software dedicated a new research facility in the Sorrento Valley Industrial Park, San Diego, Calif.

Data General Corp. is constructing a 192,000-sq-ft addition to its Southboro, Mass., facilities.

Data 100 Corp. is planning to increase its manufacturing capacity through the addition of a 9,600-sq-ft plant in Montevideo, Minn.

Computer Peripherals, Inc. is expanding its Printer Products Division with a 100,000-sq-ft facility in Nashville, Tenn.

Tal-Star Computer Systems, Inc. has moved its corporate headquarters to Princeton Junction, N.J.

Compu-Serve Network, Inc. is building a computer center and office-research complex in the Arlington Centre Research Park, Columbus, Ohio. Initial plans call for a 8,000-sq-ft DP center and a 12,000 sq ft of office and research space.

Digital Equipment Corp. plans to construct a 260,000-sq-ft addition to its Westfield, Mass., plant to expand the metals manufacturing and peripheral equipment assembly operations.

From Coast to Coast, U.S. Computer users will be attending the Computer Caravan/73.

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Justice Official Appears to Give Banks Green Light on Combining DP Services

Special to Computerworld

ANAHEIM, Calif. – A high Justice Department official appeared to give the go-ahead to the banking industry to pool its computer resources – with a few reservations – in a speech here.

Donald I. Baker, director of policy planning for Justice's Antitrust Division, said "antitrust policy is generally hospitable" to banks setting up joint venture companies to run computer centers.

"They are clearly preferable to anticompetitive mergers as a way of achieving efficiency," Baker said.

Banks have argued that to achieve low-cost data processing they must use large computers, and thus should be allowed to merge, Baker said. The joint venture solution, he noted, allows "the benefits of technology to be spread broadly throughout an industry, with institutions of various size."

But, "a joint venture which controls a key facility where no reasonable substitutes are involved," he added, "must allow fair access to all comers on equal and non-discriminatory terms."

In other words, a computer pool "cannot be used as a vehicle by which members engage in price fixing, territorial agreements or other illegal restrictions with respect to their own customers."

Interbank Agreements

Baker's statement also seemed to clear the way for interbank agreements on electronic or paperless checking, an industry observer noted.

Baker did say electronic banking "may cause striking new looks" in interstate banking, but his comments indicated that Justice does not disapprove of new banking arrangements that increase competition.

Baker's remarks showed a flexibility in looking at technological developments. "Public policy," he said, "cannot stand still in a time of rapid change . . . The opportunities are too important to miss."

He also stated, "There is a great danger in making long-term decisions – and market structure decisions are long-term – on the basis of short-term information." The Justice Department, he said, "is concerned with long-term market structures."

While these comments were directly related to the bank antitrust situation, one observer noted they might well also reflect Justice's current concern over the market structure of the computer industry.

The Justice Department official refused to comment on the pending antitrust suit against IBM, due to the trial judge's order that both IBM and Justice must remain silent on the trial.

GTE Phases Out Unit

WHITE PLAINS, N.Y. – GTE Information Systems Inc. is phasing out operations of Chester Electronic Laboratories, Inc. The move will enable the GTE unit to "concentrate efforts in the field of data communications," according to President Leonard A. Muller.

Chester Electronic Laboratories manufactures audio and video systems for the education industry, and "has not been profitable nor is the growth potential as promising as it is in other areas of our business," he noted.

IBM 'Goodies' at a Glance: Memory, Logic Combined

Special to Computerworld

ANAHEIM, Calif. – "A percolator pot full of chips," memory chips, "the equivalent of all the memory shipped by IBM since it started making computers."

This was one of the brief glimpses into IBM's "goodies" bag offered by Ted E. Climis, IBM vice-president for programming and systems development, to a special user seminar on banking here. In three to five years, Climis said, he expects to see main memories "you can put in your pocket."

Climis spoke on the capabilities and limitations of current computer technology, but spent much time describing how many current problems are going to be handled in the future.

Memory Cost Reduction

In addition to memory size reduction, he said he expected to see great reduction in memory cost and heat dissipation. Memory and logic functions may be combined, as well, he said, to decrease the number of interconnections between individual computer elements.

He also indicated IBM was concerned with:

- Intelligent terminals, as well as special application terminals.
- Computers with built-in hardware redundancy, to minimize failure; he said he expected an order of magnitude improvement in dependability.
- Highly flexible computers that can mimic other computers with great ease.

Climis described programming changes as well. He concentrated on ways on increasing programmer productivity through use of on-line programming and use of management controls.

IBM's internal experience with controlled on-line programming, he added, resulted in a 20% cost reduction and a drop by a factor of 10 in the error rate of delivered software.

The IBM vice-president also mentioned new ways of structuring data files, not in a sequential manner, but in keeping with the needs of the system. And IBM is exploring new programming techniques that rely more heavily on "straight through" programming, rather than branching, he added.

A. Watson Reelected To Two IBM Boards

WHITE PLAINS, N.Y. – Arthur K. Watson, 53, who resigned as director of IBM when he became ambassador to France, has been reelected to the board of directors and executive committee.

His brother, Thomas J. Watson Jr., 59, former chairman and chief executive officer of IBM, will retire as chairman of the executive committee in December 1973.

Ready to Roll

Digital Equipment Corp. PDP-11/40 minicomputers are wrapped for shipment at Westminster, Mass., plant. First shipments were made a month ahead of schedule.

The Computer Caravan welcomes

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The Computerworld Caravan will be the first public showing of the PRIME 200 - the first of a family of microprogrammed small computers from PRIME Computer, Inc. The new computer features a unique "software-first" design in which all system software was completely specified before hardware was developed to optimize the software's performance. Visitors to the PRIME booth will see an industry first; a new computer running fully operational system software.

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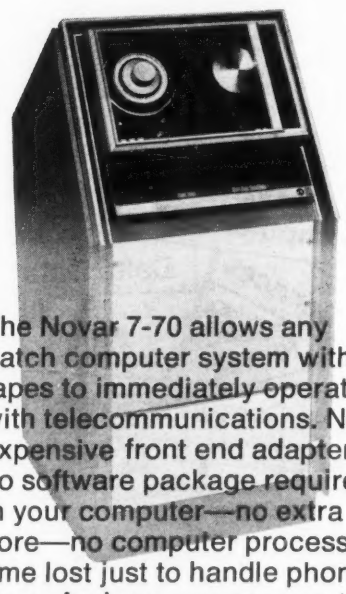

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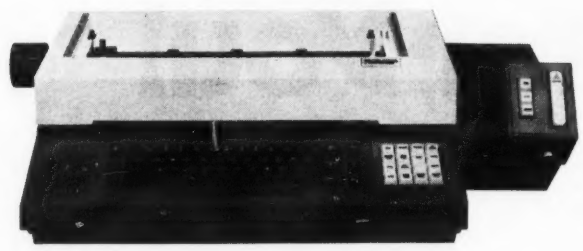

Novar 5-50 and 5-60 terminals record a full day's typing on tape —up to 73,000 characters on a single cartridge—ready for batch transmission at high speeds via telephone line. When transmission is to a Novar 7-70 Data Collector, the terminals and 7-70 together provide a complete telecommunication system.

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Don't Get Spread Thin

Project Control 'Necessary' in Software Industry

BURLINGTON, Mass. – The secret of success in the software industry, in addition to offering a good product, is good project control so that a small firm does not dissipate its resources, according to one man who made it through the recession with increased profits each year.

"It's very tempting to go into many different areas when the industry is booming," according to William Watson, chairman of MMS, Inc. and president of Software International Corp.

But if firms follow all the temptations, they often get spread too thin to do a good job in their major areas of business, he indicated, which can be disastrous when times get tough.

Software International recently announced it had completed its fifth profitable year, with a 52% increase in sales over the previous year, Watson noted, adding that sales of the firm's general ledger financial reporting system had topped the $1 million level.

It was able to do this through a combination of "a good product, good marketing and good technical backup," he said, but the major unifying ingredient was "good management."

Tight management controls, he said, are the only way a software house can assure that a product is delivered and running on time and at a profit.

Besides the sale of packages, the firm is in only one other major area of business – management consulting.

"By having a management consulting group and a multiple line of packages," he indicated, "we are able to even out our flow of work."

The two skills are complementary, he added. "Management consulting helps bring our packages to a customer's attention and also lets us know what customers are looking for in the way of new developments and new packages."

It also helps, he said, if a customer knows the firm is not just capable of consulting in identifying problems, but also can provide some solutions to those problems in the area of packaged software.

A willingness to customize packages to fit a particular user's needs and style of operation also is a plus to the firm.

"In the early days of the software business," he said, "firms would often ship a customer a package without any real support or customizing. Many customers still have scars from this type of operation."

Also, Watson noted, many firms did not look to software packages because they felt their needs were too unique for general-purpose packages.

Therefore, customizing the package to particular companies has become a must, along with a good education program to educate users in the systems.

"The user is sophisticated enough now to know what he wants a package to do – and he knows that it will have to be adapted to his operations to work well."

Education is also increasingly important, he said, because sophisticated packages are affecting many users outside of the DP department and these users have to be educated in how the system can best fit their needs.

In addition, the DP manager is now looking outside the department also, he said, and becoming more concerned with the overall operations of a firm so he is worried about the impact that new packages or systems could have on the overall company.

The packaged software market is currently the "fastest growing in the industry," Watson said.

This is partially due to the recession which made both DP managers and top corporate management more aware of controlling computer-related costs in a company.

Often, he said, it costs eight to 10 times as much to develop a particular application in-house than it does to buy the same system from a packaged software supplier – and in many cases the user doesn't really have the in-house capability for the development effort necessary to complete the project successfully.

The recession also made top management aware of the necessity for tight financial planning controls – which often rely on computer systems for speed and accuracy.

Because of all these factors, he indicated that inquiries for packages in general – and financial packages in particular – have been up dramatically in the past year over the rate of inquiries a year earlier.

Computer Effectiveness Seen In System Use, Not in Hardware

By a CW Staff Writer

ANAHEIM, Calif. – Computer system reliability is not inherent in the computer, but in the particular use of the system.

This is one lesson learned by studying the history of computer technology, reported James Pomerene of IBM.

During a Wednesday night session at the FJCC, Pomerene said the design of processors and of components impacts a computer's performance, but the type of use – e.g. number crunching or store-retrieve, etc. – is the real determinant of effectiveness.

Large memories are still important to computer design, he said, and large-scale integration is continuing to surprise experts with that technology's effectiveness.

Dr. Albert S. Hoagland, also of IBM, said that history indicates a continued demand for magnetic, electromechanical storage such as tapes and disks. While MOS technology is advancing, there is every reason to believe that magnetic memory will still be used for the foreseeable future, he said.

Hoagland, president of the IEEE Computer Society, said there is still a potential for magnetic techniques to progress in storage density, the apparent attractive point of other storage media.

'Mechanical' Advances

While electronic memories reduce access time as compared to magnetic memories, and while Hoagland foresaw advances in semiconductor and magnetic bubble memories, he also said the "mechanical" memories (disks, tapes, strips) would parallel electronic memories with technological advances.

On the software side, Walter F. Bauer of Informatics Inc. observed there have been no programming breakthroughs, "and I believe there will be none." He mentioned an oft-repeated complaint that programming techniques have progressed very slowly, compared with hardware design.

One of the causes of the slowness is that new ideas are always "slowly assimilated and used" because of the inertia of large groups of people using a particular device or idea.

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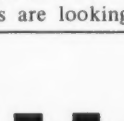

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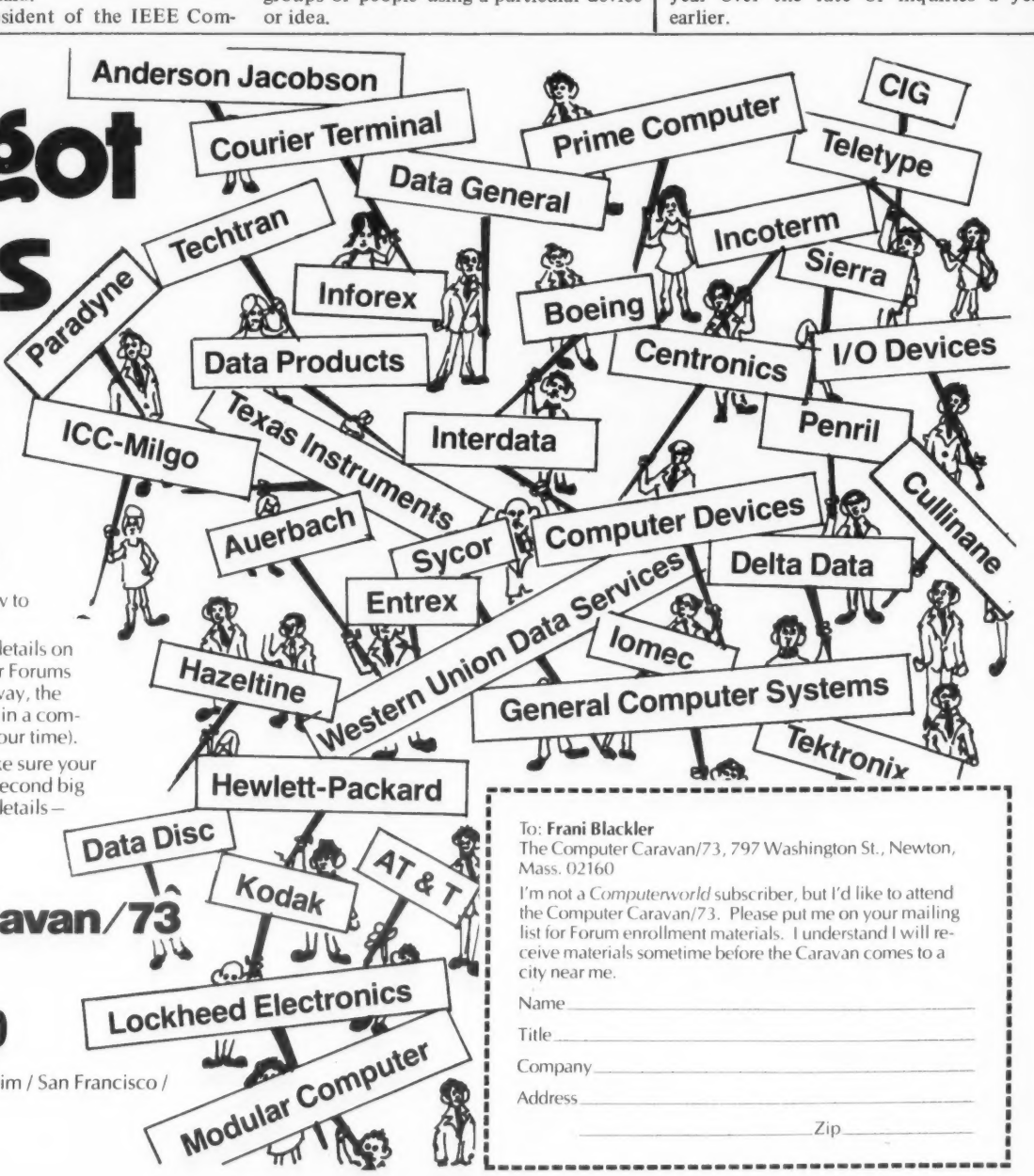

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European Caravan Highlights Regional 'Presence'

NEWTON, Mass. – "There's no such thing as the 'European' computer market," according to David Sudkin, marketing manager for the European Computer Caravan (ECC), sponsored by *Computerworld*.

"The market," he added, "is divided along regional and national lines and U.S. firms entering Europe for the first time should be aware of this."

Partly because of this, Sudkin said, the European Computer Caravan has gone from three separate tours to four by splitting off the Scandinavian countries and The Netherlands from the English-speaking segment of the journey.

Revised Schedule

Under the revised schedule, the French Language Market Computer Caravan will kick off the European Caravan with visits to six cities between May 2 and June 7, with three-day stopovers in each city.

This will be followed by four cities in the English Language Market Caravan Sept. 4-27, he said, followed by a three-city tour to Scandinavia and The Netherlands Oct. 9-25.

The final tour on the journey will cover five cities in the German Language Market Computer Caravan Oct. 30-Nov. 30.

The price for the different tours runs to $1,500 per city covered, Sudkin noted, with the French tour carrying a price tag of $9,000; the English tour, $6,000; and the Scandinavian tour priced at $5,000. The price for a combined UK, Scandinavian tour is $10,500. The German Market Caravan costs $7,500.

Sudkin said it is important for a U.S. company planning to enter the European market to establish a "presence" in each local area. Going to just one major city in each country doesn't have this effect, he said.

"European users are becoming increasingly more alienated at the prospect of suppliers who don't make more of an effort to establish themselves than making a one-shot appearance in a national show," he charged.

"They want – and need – a vendor willing and able to stay and support them in their local area," he added.

Because of this, Sudkin said trade fairs in the capitols of the European countries might be all right "where service and support to the customer are not important – OEM sales, perhaps – but these programs are counter productive for end-user selling.

"It is important to recognize nationalism as an important factor in developing European marketing strategies and tactics," Sudkin claimed.

"ECC/73 not only will allow the exhibitor to establish a sense of presence in local market areas but by having local French sales reps talk with French customers, German with German, etc. they will respond to the nationalistic orientation of their prospects."

Another "plus" offered by the ECC, Sudkin said, is that it is not limited to U.S. manufacturers.

"ECC/73 is multinational with respect to exhibitors. That is, ECC/73 will not be limited to U.S. DP firms but will include a large number of European companies," he said.

"This is an extremely important factor in attracting European users to any trade show and especially if you are asking them to travel any distance at all.

"The realities of Europe dictate that if you want a significant and quality attendance at a trade show, you must have a wide spectrum of products on exhibit. And in Europe this requires the participation of indigenous manufacturers."

In all, Sudkin said the ECC will provide access to more than 80% of the total Western Europe computer market, but the exhibitor can pick a select area if he wants and still have a caravan to suit his needs.

Rising Minicomputer Sales Called A Blessing for Teleprinter Market

MAHWAH, N.J. – The booming sales of minicomputer systems are expanding the market for teleprinters and associated interface services, according to Z. V. Zakarian, president of Western Union Data Services Co.

Whenever a mini maker sells a system, he said, the customer will require an average of five terminals, usually Model 33 teletypewriters.

In many cases, the mini maker does not want to get into the business of purchasing, warehousing, engineering and maintaining terminals, he said, preferring to spend capital on its main area of business – making minis.

Thus companies engaged in marketing and servicing terminals have found an increasing number of their sales come from sales to minicomputer users, he noted.

Generally, the mini maker also leaves the job of interfacing terminals to its systems to the terminal supplier, Zakarian indicated.

"Our experience has been that while EIA interface standards have been established for the industry, interface requirements vary from manufacturer to manufacturer, often within their own product line.

"Of course, EIA standards were originally designed around the requirements of the Bell System's 103 modem. The 25 pin connector that a Model 33 comes equipped with was designed to be plugged into the 103 modem.

"Consequently, directly connecting a terminal to minicomputers necessitates the engineering of an interface that accounts for all the functions expected by the terminal's 25 pin connectors," he stated.

Orders & Installations

The State University of New York, Buffalo, has ordered a Univac 1106 system for administrative applications, including student admissions, registration, invoicing and grading, budget projection and control, accounting and classroom scheduling.

Philco-Ford Corp. has installed two Control Data Corp. Cyber 70 Model 73 systems to serve as the Mass Data Storage Facility for Nasa's Skylab project.

The Wexler Coffee Co. has leased an IBM 360/20 for 36 months from Simplicity Computer Corp.

The Present Co., Inc., a catalog merchandising firm, has installed an NCR Century 50 along with 22 NCR 5 cash registers for a new inventory control system.

The Colorado Springs Training Center for the International Typographical Union has installed a Datatype Corp. OCR Setype System for apprentice training programs.

Martin Marietta Aluminum Co. has ordered a minicomputer interactive graphics system from Systems, Science and Software for the preparation and check-out of N/C machine tapes.

Nasa's Manned Spacecraft Center has ordered dual System 86 computers from Systems Engineering Laboratories, Inc. for analog simulating environmental dynamics encountered in the development of the space shuttle's vehicle control and guidance systems.

Blue Cross of Northeast Ohio has installed the Automated Tape Library Accounting System by GTE Data Services Inc.

The Central Kansas Medical Center, Great Bend, has installed an NCR Century 100 for in-patient and post-discharge receivables, accounts payable, general ledger and inventory control.

Electronic Data Systems, New York, has installed 512K of Itel Corp memory on an IBM 360/65 for a total capacity of 768K.

The Wilmington Trust Co. and The Farmers Bank of the State of Delaware are installing Data Source Corp.'s Credit System 80 in 180 merchant locations. The system will expedite credit authorization and provide the banks with credit authorization data.

The Grand Union supermarket, Ridgewood, N.J., has installed the Super/Spice supermarket point-of-sale system by Pitney Bowes-Alpex.

Pershing & Co., Inc., stockbrokers, has ordered a C-System telecommunications network from Collins Radio Co. The net will link Pershing and correspondent offices in 275 U.S. cities.

Marine Midland Bank of New York has ordered an ICL 1902S and software for its London branch.

First Wisconsin National Bank has replaced the IBM memory on a 360/65 with 512K of Itel memory.

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Pertec 1st-Quarter Net Declines

LOS ANGELES – Pertec Corp. has started off fiscal 1973 in the same fashion as the last 1972 quarter: rising revenues and declining earnings compared with the year-ago results.

But in the first quarter last year Pertec made especially heavy shipments of key-to-tape systems to Singer Co., which was in the process of stocking its sales organization.

"The increased shipments were reflected in the higher revenues and earnings in the key-to-tape product line for last year's first quarter, noted President Harold A. Kurth.

In addition, the first quarter saw increased engineering and marketing expenses, compared with the year-ago period, he said.

Revenues rose 6% to $5.9 million from $5.6 million in the same 1972 period.

Earnings dropped to $454,000 or 15 cents a share from $604,000 or 20 cents a share in the first quarter last year.

Revenues showed a strong increase in all product lines in the quarter except in shipments of key-to-tape systems to the Singer Co., Kurth said.

"We have had continued increases in earnings since the third quarter of last year, in spite of our high level of expenditures for engineering and marketing expenses; the effect of which cannot be realized until future quarters," he added.

Scanning Makers Show Improvement

Scan-Data Corp. and Optical Scanning Corp. have reported improved results in recent periods, although both are still showing losses over longer terms.

In the quarter ended Sept. 30, Scan-Data showed earnings of $102,254 or 6 cents a share, compared with a loss of $210,033 or 19 cents a share in the 1971 period.

Tax Credit

The 1972 figure includes a tax credit of $42,582. In 1971 increases from five to seven years in the estimated lives of demonstrators, service center systems and systems on lease, plus cancellation of a financing lease on a shipment recorded as a sale were retroactively reflected in an increase in loss per share by 4 cents for the quarter and 8 cents for the nine months.

Revenues almost doubled to $2 million from $1 million.

The loss for the nine months was cut to $280,389 or 22 cents a share from $1 million or 94 cents a share in the 1971 period. Revenues for the nine months rose to almost $4 million, more than double the $1.9 million a year ago.

Optical Scanning reported a first-quarter loss of $49,961 or 8 cents a share compared with a loss of $501,895 or 79 cents a share in the year-ago period.

Revenues Up

Revenues in the year ended June 30 rose 20% to $9.9 million from $8.3 million in 1971, and the loss for the period was cut to $2.9 million or $4.64 a share compared with $3.8 million or $6.22 a share.

Including the effects of changes in accounting principles, the write-down of equipment and inventory, the firm had a total loss of $12.7 million in 1971.

Optical Scanning is seeking additional working capital through private financing and an extension of its bank line of credit. So far, the company has received a $1 million firm commitment from a private source and is negotiating with the bank and other sources, the firm said.

Wang Posts First-Quarter Loss

TEWKSBURY, Mass. – Wang Laboratories, Inc. had a glum first quarter ended Sept. 30, but expects to return to profitability in the second quarter.

Start-up costs on a computerized typewriter, and increased marketing expenses for its calculator line were among the factors cited when the firm announced a first-quarter loss of $116,626 or 3 cents a share compared with earnings of $557,995 or 14 cents a share in the year-ago period. Revenues rose slightly, to $8 million from almost $7.9 million.

The lower than anticipated sales volume was caused by temporary delays in deliveries of several key peripheral devices which "have become increasingly significant" in the sales of the systems, the firm said.

Increased development expenditures for new products, including the 2200 Basic language calculator, were expended during the period.

In the second quarter sales should reach $10 million to $14 million, President An Wang said.

Acquisitions

Informatics Inc., an independent software company, has agreed in principle with **Autocomp Inc.** to combine both firms in exchange of stock. Autocomp is an electronic photocomposition and information systems company.

Data Access Systems Inc., terminal and communications equipment firm, has acquired **Datron Equipment Co.**, New Jersey-based data-handling equipment manufacturer. Datron will operate as a wholly owned subsidiary of Data Access Systems.

Transnet Corp., a services firm, has agreed to acquire **Sigmatron Inc.**, a display device manufacturer. The transaction will involve an exchange of stock and is subject to approval by stockholders of both companies.

Halliburton Co. will acquire two subsidiaries of **Boise Cascade, Ebasco Services Inc.** and **Vernon Graphics**, for $65 million.

Technology Service Corp. has acquired **Interstate Communications Inc.** for an undisclosed amount of cash. Interstate Communications, which designs communications systems, will operate as a wholly owned subsidiary.

Plymouth Computer Services Inc., New York, has acquired **Programming Sciences International**, London, a consulting and software company. The newly-acquired firm will be known as Plymouth Services International Ltd.

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Computerworld Stock Trading Summary

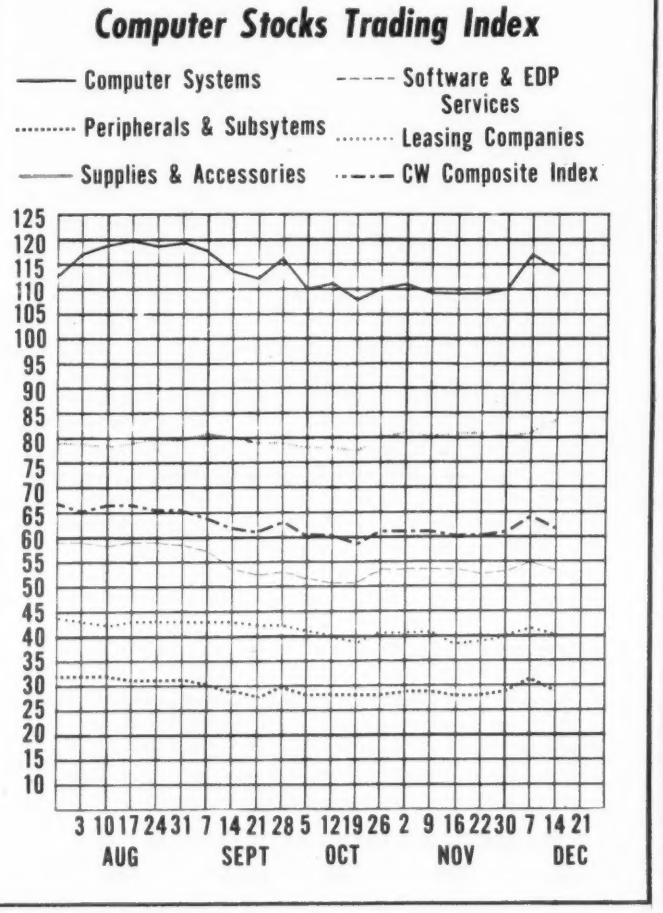
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, DECEMBER 14, 1972

EXCH		1972 RANGE (1)	CLOSE DEC 14 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2 1/8	- 1/4	-10.5
A	APPLIED DATA RES.	3- 7	4	- 1/8	-3.0
O	APPLIED LOGIC	1- 4	3	- 1/8	-4.0
N	AUTOMATIC DATA PROC	72- 99	94 7/8	- 5/8	-0.6
O	BRANDON APPLIED SYST	1- 2	1	0	0.0
O	COMPUTER DIMENSIONS	5- 14	4 1/2	- 1/2	-10.0
O	COMPUTER DYNAMICS	1- 4	1 1/4	0	0.0
O	COMPUTER NETWORK	3- 7	4	- 1/4	-5.8
N	COMPUTER SCIENCES	4- 10	5 1/2	- 5/8	-10.2
O	COMPUTER TASK GROUP	1- 2	1 1/4	+ 1/8	+11.1
O	COMPUTER TECHNOLOGY	3- 8	3 1/4	+ 1/4	+8.3
O	COMPUTER USAGE	7- 14	9 1/8	+ 1/8	+1.3
O	COMP AUTOMAT REPORTS	5- 9	6 5/8	-1	-13.1
N	COMPUTING & SOFTWARE	14- 28	15 7/8	- 5/8	-3.7
O	COMRESS	1- 3	1 1/8	- 1/8	-10.0
O	COMSHARE	5- 10	8 1/8	+ 5/8	+8.3
O	DATATAB	4- 9	4	- 1/4	-5.8
O	EDP RESOURCES	2- 8	2 3/4	- 1/4	-8.3
A	ELECT COMP PROG	1- 5	1 5/8	0	0.0
N	ELECTRONIC DATA SYS.	43- 65	54 3/4	-4 1/2	-7.5
O	INFORMATICS	5- 11	5 1/4	- 3/4	-12.5
O	I.O.A. DATA CORP	1- 3	5/8	- 3/8	-37.5
O	KEANE ASSOCIATES	4- 7	3 1/2	0	0.0
O	KEYDATA CORP	7- 13	11	+ 1/8	+1.1
O	LOGICON	4- 9	4 7/8	- 1/8	-2.5
A	MANAGEMENT DATA	4- 10	4 3/4	- 5/8	-11.6
O	NATIONAL CSS INC	8- 31	28 7/8	- 3/4	-2.5
O	NATIONAL INFO SRVCS	2- 5	1 1/2	0	0.0
P	ON LINE SYSTEMS INC	8- 28	24	-2 1/2	-9.4
M	PLANNING RESEARCH	6- 17	6 1/2	-2 3/4	-29.7
O	PROGRAMMING METHODS	20- 25	25 1/2	+ 3/8	+1.4
O	PROGRAMMING & SYS	1- 2	1 1/4	0	0.0
O	RAPIDATA INC	5- 27	25 1/4	-1	-3.8
O	SCIENTIFIC COMPUTERS	2- 4	1 3/4	- 1/8	-6.6
O	SIMPLICITY COMPUTER	1- 5	3 3/4	+ 7/8	+30.4
O	TBS COMPUTER CENTERS	3- 6	3 1/8	0	0.0
O	TCC INC	1- 3	5/8	0	0.0
O	TYMSHARE INC	7- 11	9 3/8	- 3/8	-3.9
O	UNITED DATA CENTER	5- 8	6	+ 1/4	+4.3
N	UNIVERSITY COMPUTING	9- 26	11 1/8	- 7/8	-7.2
A	URS SYSTEMS	6- 10	8 1/8	+ 1/2	+6.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	34- 49	34	-1	-2.8
O	ADVANCED MEMORY SYS	12- 23	15	-3	-16.6
N	AMPEX CORP	5- 15	6 3/8	- 3/8	-5.5
O	ANDERSON JACOBSON	4- 8	4 3/8	0	0.0
O	ATLANTIC TECHNOLOGY	1- 11	1/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 8	6 7/8	- 1/8	-1.7
A	BOLT,BERANEK & NEW	5- 21	12 1/2	-1	-7.4
N	BUNKER-RAMO	9- 14	9 1/2	- 3/8	-3.7
A	CALCOMP	9- 25	11 3/4	-1 3/4	-12.9
O	CAMBRIDGE MEMORIES	9- 15	12	- 3/8	-3.0
O	CENTRONICS DATA COMP	6- 28	23 1/2	-3 1/2	-12.9
O	COGNITRONICS	2- 5	2 3/4	- 3/8	-12.0
O	COMPUTER COMMUN.	1- 7	2 1/2	- 1/4	-9.0
A	COMPUTER EQUIPMENT	2- 4	2 5/8	- 1/4	-8.6
O	COMPUTER MACHINERY	7- 13	9 5/8	- 7/8	-8.3
A	COMPUTEST	3- 9	4	- 3/8	-8.5
A	DATA PRODUCTS CORP	3- 7	3 7/8	- 1/4	-6.0
O	DATA RECOGNITION	1- 5	1 1/4	0	0.0
O	DATA TECHNOLOGY	2- 5	2 3/8	- 1/8	-5.0
O	DIAN CONTROLS	0- 8	4 3/8	- 1/8	-2.7
N	ELECTRONIC M & M	3- 8	5 1/8	- 3/8	-6.8
O	FABRI-TEK	2- 5	4 1/8	+ 3/8	+10.0
O	GENERAL COMPUTER SYS	6- 16	6	-1	-14.2
N	GENERAL ELECTRIC	59- 70	68 1/2	-1 1/8	-1.6
N	HAZELTINE CORP	7- 13	8 5/8	- 7/8	-9.2
O	INFOREX INC	20- 36	20 1/2	-4 5/8	-18.4
O	INFORMATION DISPLAYS	1- 5	1 1/2	0	0.0
A	LUNDY ELECTRONICS	8- 14	8 1/8	-1 1/8	-12.1
O	MANAGEMENT ASSIST	1- 2	3/8	0	0.0
A	MILGO ELECTRONICS	15- 44	23 7/8	-1 1/2	-5.9
N	MOHAWK DATA SCI	12- 27	12 7/8	-1 5/8	-11.2
O	OPTICAL SCANNING	6- 16	6	0	0.0
O	PERTEC CORP	8- 17	8 3/4	- 1/8	-1.4
O	PHOTON	6- 15	6 3/8	- 3/4	-10.5
A	POTTER INSTRUMENT	7- 21	9 3/8	-1 1/4	-11.7
O	PRECISION INST.	3- 13	3 3/4	-1	-21.0
O	RECOGNITION EQUIP	5- 15	8 3/8	-1 1/4	-12.9
N	SANDERS ASSOCIATES	13- 21	17 7/8	+ 5/8	+3.6
O	SCAN DATA	5- 13	5 3/4	+ 3/8	+6.9
O	STORAGE TECHNOLOGY	17- 39	29	-2 1/8	-6.8
O	SYCOR INC	7- 11	9 1/4	- 1/2	-5.1
O	TALLY CORP.	8- 15	10 1/8	0	0.0
N	TEKTRONIX INC	34- 64	50 1/2	-1 5/8	-3.1
N	TELEX	6- 15	6 1/2	- 1/2	-7.1
O	WILTEK INC	10- 26	17 1/2	-1 1/2	-7.8
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	5- 9	6	+1 1/4	+26.3
A	BARRY WRIGHT	9- 14	13 3/8	+1	+8.0
A	DATA DOCUMENTS	17- 26	22 1/2	+ 5/8	+2.8
O	DUPLEX PRODUCTS INC	8- 16	10 1/4	+ 1/2	+5.1
N	ENNIS BUS. FORMS	6- 10	7	0	0.0
O	GRAHAM MAGNETICS	15- 27	14 1/4	- 7/8	-5.7
O	GRAPHIC CONTROLS	11- 15	12 3/4	- 3/8	-2.8
N	3M COMPANY	76- 86	85 3/8	+1 1/2	+1.7
O	MOORE CORP LTD	42- 57	55 1/2	0	0.0
N	NASHUA CORP	48- 62	58 1/8	- 1/8	-0.2
O	REYNOLDS & REYNOLD	37- 77	49 1/2	0	0.0
O	STANDARD REGISTER	14- 20	17 3/8	+1 5/8	+10.3
O	TAB PRODUCTS CO	14- 23	21 3/4	+ 3/4	+3.5
N	UARCO	21- 28	23 3/8	- 1/4	-1.0
A	WABASH MAGNETICS	6- 11	6 7/8	- 1/2	-6.7
N	WALLACE BUS FORMS	21- 26	26	+1	+4.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-229	225	-3 7/8	-1.6
N	COLLINS RADIO	14- 24	23 5/8	- 1/8	-0.5
N	CONTROL DATA CORP	43- 78	61 1/4	-5 1/2	-8.2
O	DATA GENERAL CORP	56-115	110	-2	-1.7
O	DIGITAL COMP CONTROL	5- 25	5 1/4	- 1/4	-4.5
N	DIGITAL EQUIPMENT	72-101	94 3/4	+2 1/8	+2.2
N	ELECTRONIC ASSOC.	6- 13	8 3/4	- 5/8	-6.6
A	ELECTRONIC ENGINEER.	6- 14	8 5/8	- 1/8	-1.4
N	FOXBORO	23- 41	30 7/8	-2	-6.0
O	GENERAL AUTOMATION	13- 39	38 3/4	+2	+5.4
O	GRI COMPUTER CORP	2- 5	2 3/4	0	0.0
N	HEWLETT-PACKARD CO	46- 81	77 7/8	- 1/8	-0.1
N	HONEYWELL INC	118-170	133 1/4	+ 3/8	+0.2
N	IBM	333-426	395 1/2	-1 1/4	-0.3
O	INTERDATA INC	8- 16	9 5/8	- 5/8	-6.0
N	MEMOREX	15- 38	18 3/4	-1 1/8	-5.6
O	MICRODATA CORP	5- 10	8 1/8	-1 3/8	-14.4
N	NCR	29- 38	31 3/8	-1 3/8	-4.1
N	RAYTHEON CO	27- 47	36 1/4	- 3/4	-2.0
N	SPERRY RAND	30- 50	50	0	0.0
A	SYSTEMS ENG. LABS	7- 16	7 5/8	-1	-11.5
N	VARIAN ASSOCIATES	14- 22	18 1/2	-1	-5.1
N	VICTOR COMPTOMETER	15- 24	18 3/4	+1	+5.6
N	WANG LABS.	23- 61	27 1/4	-2 3/8	-8.0
N	XEROX CORP	121-172	149	-4 3/4	-3.0
	LEASING COMPANIES				
A	BOOTHE COMPUTER	3- 18	3 5/8	- 3/8	-9.3
O	BRESNAHAN COMP.	1- 3	1 3/4	+ 1/8	+7.6
O	COMPISCO INC	3- 18	13 1/2	+ 1/4	+1.8
O	COMMERCE GROUP CORP	5- 11	6 1/4	- 1/4	-3.8
O	COMPUTER EXCHANGE	1- 3	1	0	0.0
A	COMPUTER INVSTRS GRP	7- 14	7 1/4	- 3/4	-9.3
N	DPF INC	5- 13	5 7/8	- 5/8	-9.6
M	DATRONIC RENTAL	2- 4	2	0	0.0
A	DCL INC	2- 10	3	- 1/8	-4.0
A	DEARBORN-STORM	16- 26	20 3/4	- 1/2	-2.3
A	DPA, INC.	5- 8	7 1/8	- 1/4	-3.3
A	GRANITE MGT	5- 11	5 3/8	- 3/8	-6.5
A	GREYHOUND COMPUTER	6- 11	6 1/2	- 1/8	-1.8
A	ITEL	7- 12	10 1/2	-1 1/4	-10.6
N	LEASCO CORP	17- 24	22	- 3/4	-3.2
O	LEASPAC CORP	6- 15	7 3/8	- 1/8	-1.6
O	LECTRO MGT INC	1- 4	2 3/8	- 1/2	-17.3
A	ROCKWOOD COMPUTER	2- 7	2 1/2	- 3/8	-13.0
O	SYSTEMS CAPITAL	3- 20	10 3/8	-1 1/2	-12.6
N	U.S. LEASING	19- 33	30 1/4	+ 7/8	+2.9

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

INTERDATA
Three Months Ended Sept. 29

	1972	1971
Shr Ernd	$.12	$.06
Revenue	3,310,400	2,645,600
Tax Cred	81,000	48,300
Earnings	236,800	108,800
9 Mo Shr	.36	.....
Revenue	9,270,000	6,234,000
Tax Cred	349,700	.....
Earnings	694,700	(2,300)

BUNKER-RAMO
Three Months Ended Sept. 30

	1972	1971
Shr Ernd	$.12	a
Revenue	62,154,846	$53,642,023
Earnings	18,729,892	18,674,481
9 Mo Shr	.35	.03
Revenue	187,797,703	166,739,794
Earnings	8,701,907	2,479,978

a-Preferred dividend requirements were approximately equivalent to net income.

NATIONAL INFORMATION SYSTEMS
Nine Months Ended Sept. 30

	1972	a1971
Shr Ernd	$.06	$.05
Revenue	5,854,737	4,609,712
Spec Cred	.....	b47,300
Earnings	252,921	219,203

a-Restated. b-Represents $111,300 tax loss carryforward less a $64,000 reduction in goodwill.

TELECOM
Three Months Ended Sept. 30

	1972	1971
Shr Ernd	$.42	$.38
Revenue	15,957,861	14,974,696
Spec Cred	.....	a123,131
Earnings	755,705	606,384

a-From sale of securities.

DIGITAL EQUIPMENT
Three Months Ended Sept. 30

	1972	1971
Shr Ernd	$.33	$.29
Revenue	51,741,000	38,412,000
Earnings	3,427,000	2,940,000

GRAPHIC SCIENCES
Three Months Ended Sept. 30

	a1972	1971
Shr Ernd	$.13	$.02
Revenue	3,007,967	2,052,427
bSpec Cred	189,000	33,800
Earnings	400,152	64,250

a-Includes 100% of the operations of a subsidiary company, previously 80%-owned by the company. The remaining 20% was acquired during the quarter ended Sept. 30, 1972. b-Tax loss carryforwards.

GRAHAM MAGNETICS
Three Months Ended Sept. 30

	1972	1971
Shr Ernd	$.31	$.42
Revenue	2,400,000	2,100,000
Spec Cred	.....	133,480
Earnings	279,403	284,207

ANDERSON JACOBSON
Three Months Ended Sept. 30

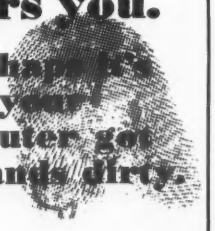
	1972	1971
Shr Ernd	$.03	$.02
Revenue	1,305,823	1,191,740
Earnings	75,182	52,926
6 Mo Shr	.06	.03
Revenue	2,503,075	2,016,451
Spec Cred	36,694	.....
Earnings	162,694	76,061

LOGICON
Six Months Ended Sept. 30

	1972	1971
Shr Ernd	$.31	$.28
Revenue	6,165,253	5,395,374
Earnings	271,382	241,270

Better material control is what the Sierra 770 System offers you.

Perhaps it's time your computer got its hands dirty.



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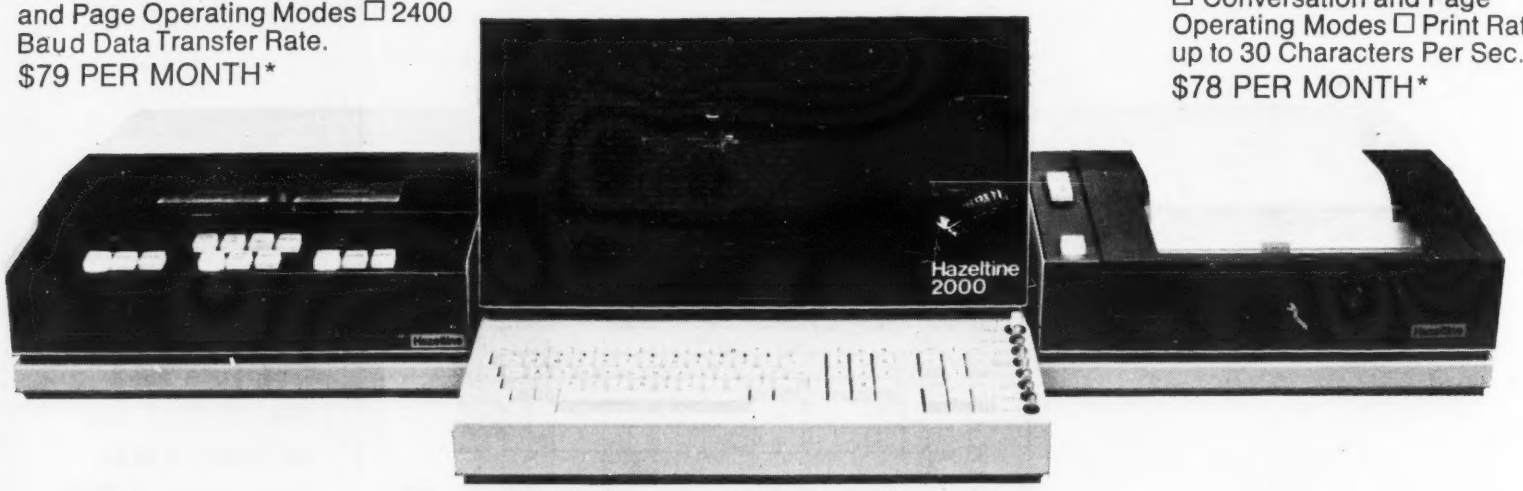
$79 PER MONTH*

3. Or add the Printer Unit for silent hard copy.

☐ Conversation and Page Operating Modes ☐ Print Rates up to 30 Characters Per Sec.

$78 PER MONTH*



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